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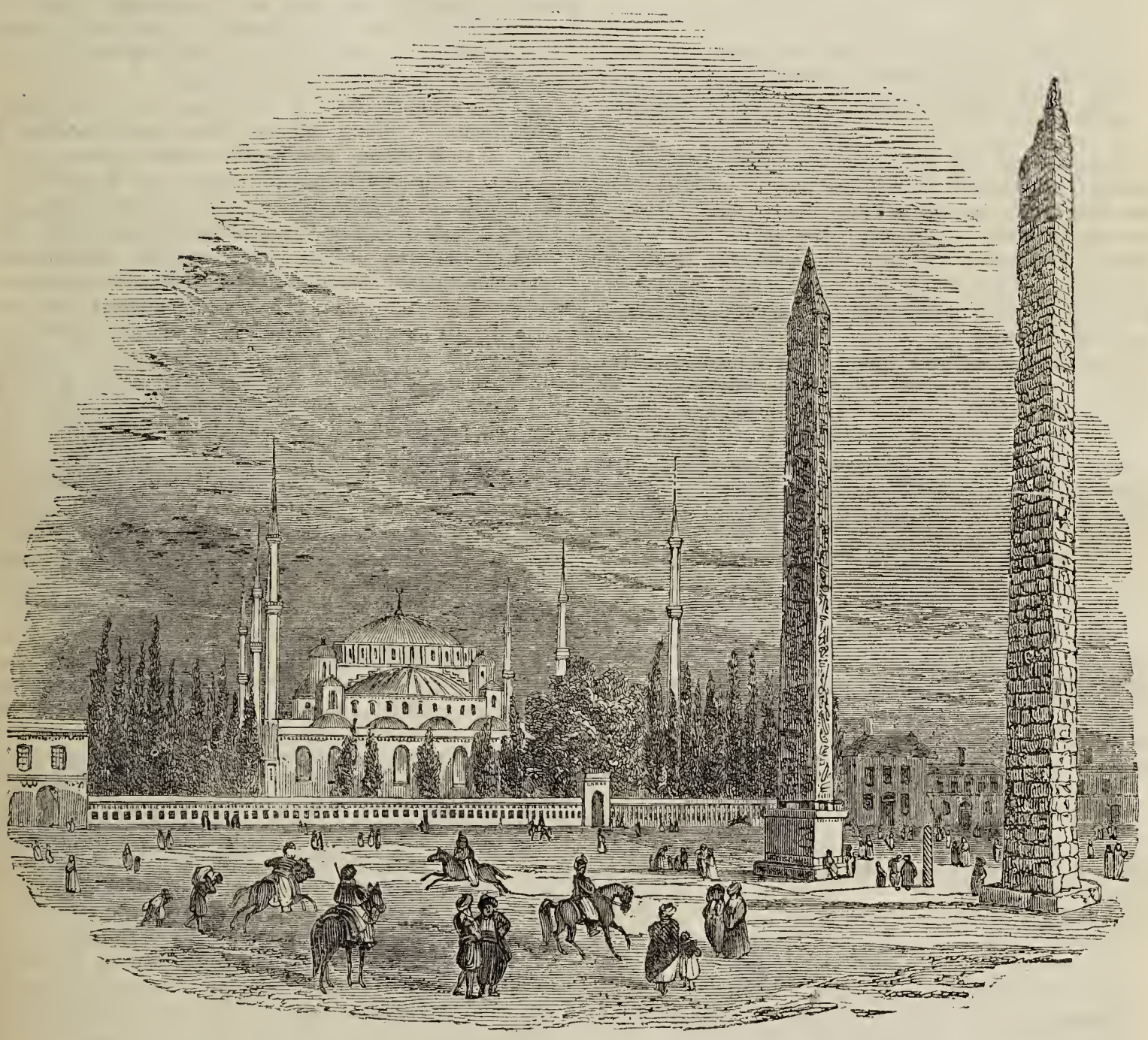
THE AT-MEIDAN AND ITS PILLARS.



[From a Correspondent.]

THE At-Meidan, or antient race-course, of Constantinople, is an oblong space of ground of 500 paces long by 100 broad, but that portion of it which is comprised within the paved causeways that surround it, and which, from the nature of the ground, seems to be the only part fit for such purposes, is only 240 paces long by 86 broad; and this explanation will partly reconcile the statements of Wheeler and Hobhouse, the former of whom says it is 550 paces by 120, and the latter 250 by 150. I, however, measured it carefully within the causeways, and was followed by a Greek whose pace was the same as my own (27 inches), and we both made it 240 by 86, which in round numbers may be called 550 by 200 feet. On the one side of this open space stands the splendid mosque of Sultan Achmet, with its six tall slender minarets peeping from the foliage surrounding the domes and walls; on the opposite side, a gilded and gaudy hospital; while the two ends are covered with shabby and ruinous buildings. Towards one of the ends stands the obelisk of Theodosius, the square pillar of Constantine Porphyrogenitus, and, midway between them, a fragment of the brazen column which is said to have supported the Delphic tripod.

From each corner of the At-Meidan there are streets issuing, which lead to the different quarters of the city, and it is undoubtedly the best place in Constantinople for a public meeting of the people, consequently it has always been, in any popular tumult, the general rendezvous of the insurgents. Two trees are still to be seen, nearly opposite to the pillars, between which the headless body of Bairactar was suspended by the feet, on the 19th of November, 1808, during the tumult raised by the Janissaries at the commencement of the late sultan's reign.

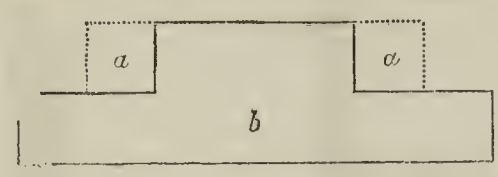
The obelisk and the pedestal upon which it stands are two half monuments of an incongruous character, that chance seems, in one of her caprices, to have thrown together. The obelisk is of the same form, size, and ap-

pearance as the one lately brought from Luxor, in Egypt, and erected at Paris, and, from the hieroglyphics with which it is covered, evidently does not belong to any country in Europe. It is formed of Theban marble, and is of a brownish red colour; it stands upon a pedestal 15 feet high, and is itself 75, making in all 90 feet. The breadth at the bottom of the obelisk is 7 feet, and below the level at the top 5 feet. The pedestal is the work of another people and another æra, and appears to have been the base of some other monument connected with the ancient sports of the place. It bears on one side, at the bottom, a Latin inscription, and on the opposite side a Greek one to the same import. The Latin one is as follows:—

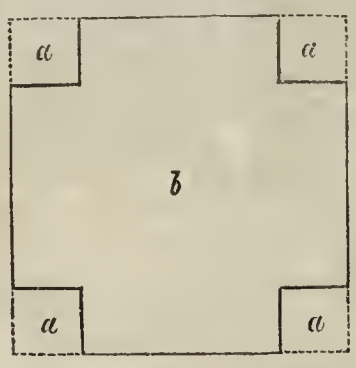
DIFFICILISQVONDAMDOMINISPARERESERENIS
IVSSVSETEXTINCTISPALMAMPORTARETYRANNIS
OMNIATHEODOSIOCEDVNTSVBIOLIQVEPERENNI
TERDENISSICVICTVSECODOMITVSQVEDIEBVS

It seems probable from appearances, both of column and pedestal, that all Theodosius had to do in the affair was only to set up—not to bring there or form—the block bearing his name. The pedestal seems as if it was the base of a fountain: on one side there is a trough, cut perpendicular from top to bottom, evidently for the purpose of conveying water from some cistern which does not now exist near it.

The base consists of a square block of marble, measuring 11¼ feet on two sides, and 12 on the other two, and stands 3 feet above ground. On the centre of this, but still the same block, is a smaller square, of 6 feet on all sides, and 2 feet in height, having four blocks of red granite, one at each corner, of cube form, 2 feet on all sides, thus:—



[Perpendicular view of the base. *a*, granite blocks; *b*, marble block.]



[Horizontal view of the top of the base. *a*, granite blocks; *b*, marble block.]

On the top of this stands another huge marble block, of a cube form, 8 feet in height, and sufficient in breadth and width to cover the under block, as well as the corners of granite. This has a plain capital, upon which is placed, about two feet from the margin of each corner, a cube block of brass, measuring 22 inches upon each side, so stationed as to receive the four corners of the obelisk, leaving a space under it sufficient for any one to climb up, and, by getting under it, show his portrait out of each side.

These two marble blocks are covered over with sculpture in bas-relief, of the most exquisite kind. The base, besides the inscriptions on two sides, has, on the other, two representations of the races, on foot, on horseback, and in chariots, as also a view of the obelisk itself lying on the race-ground. The upper block is filled with figures of umpires, judges, soldiers, musicians, and dancing-girls; in fact, so much does every part of it refer to games and sports, that it seems as if it must have been a fountain or monument, shading or supporting the place where sat the umpires of the race-course.

Tournefort says there is upon the pedestal a representation of the machinery by which the obelisk was raised; but his eyes must have deceived him, as there is not now the slightest vestige of such, nor any space from which it could have been broken off. Little, however, is actually known of either the column or its pedestal, but it merits the attention of the antiquarian, as it is the most perfect specimen of sculpture now in Turkey, and superior to any bas-relief in the museums of France or England; and yet it is perfectly exposed, and may be chipped with impunity by any one who is disposed to take the trouble, and I saw a Frank knock a piece off one of the figures with the iron end of his walking-stick, for no other reason but to try how hard it was.

At the distance of a few yards from the obelisk stands a fragment of a brazen pillar, which exactly resembles a piece of an enormous ship's cable stuck upright in the ground. This column is said to have been brought from the temple of Delphi, where it supported the famous golden tripod, which the Greeks, after the battle of Platæa, found in the camp of Macedonius, and Mr. Hobhouse is of opinion that Gyllius has established its identity without any doubt. Tournefort, who saw it in 1700-2, says that it stood "15 feet high, formed by three serpents twining spirally round like a roll of tobacco; their contours diminish insensibly from the base, as far as the necks of the serpents, and their heads, spreading on the sides like a tripod, compose a kind of chapiter. Sultan Mourat is said to have broken away the head of one of them. The pillar was thrown down, and both the other heads carried away in 1700, after the peace of Carlowitz, and no one knows what has become of them;" but Gibbon, speaking of the conquest of Constantinople, on the 29th of May, 1454, by Mohammed II., says, "In the Hippodrome, or At-Meidan, his eye was attracted by the twisted column of the three serpents; and as a trial of his strength he shattered, with his iron mace, or battle-axe, the under jaw of one of these monsters, which, in the eyes of the Turks, were the idols or talismans of the city."

This story Gibbon gives on the authority of Thevenot, yet every traveller, remarks Mr. Hobhouse, from Gyllius to Wheeler, describes it as entire. Sandys says it was "a column of wreathed brass, with three infolded serpents extended in a triangle, looking several ways." Lady Montagu says, "the three serpents have their mouths gaping." Chishull says, "the heads were taken off privately by the servants of the Polish ambassador," and Hobhouse is of opinion that it is not known whether the top or bottom be now inserted in the ground—but his opinion cannot be of much value, as he calls it seven feet high (this was about 1812), and in 1838, when I visited it, I found it 12 feet 4 inches above ground, and tapering towards the top as Tournefort relates. It is hollow, filled with stones and earth, as can be seen from some fissures in the side of it. The diameter at the base is about twenty-two inches, and fifteen at the top; the folds of the serpent are about twelve inches each in diameter at the centre, of course smaller at the top and larger at the bottom, and it is matter of astonishment that it has not long ago been broken down and carried away for the sake of the metal.

Near to the brazen column stands the square pillar of Constantinus Porphyrogenitus, in apparently a tottering condition—so much so, indeed, that it appears certain to fall with the first breath of wind—yet it had the same appearance in the days of Tournefort, who pronounced it about to fall when he saw it. Its looks however belie it, as a closer inspection shows it to be of most solid and massy masonry, each block of stone riveted to its neighbour with an iron rod. It has been robbed of

its coating of burnished brass plates, the square holes that attached them covering almost every marble from top to bottom. The base measures 10¼ feet in breadth and three in height from the ground; the pillar itself is 8½ feet in breadth, and about 120 feet high; time and the elements have robbed it of almost all its mortar, and to this may be ascribed its tottering appearance, as the stones at first look ready to tumble down for want of something to hold them together; they are marble, granite, and soft stone, mixed indiscriminately, and in many of the chinks, half way up and near the top, the vine twig seems flourishing and green as in a vineyard. Tournefort, in describing it a century and a half ago, remarks, "The tip is fallen, and the rest cannot long hold together"—yet the *half* of the tip is still there, and will, in all probability, still be there, when the palaces surrounding it on every side will be destroyed and forgotten.

Until lately, the At-Meidan was every Friday the scene of horse-racing, feats of strength, agility, &c. &c., but these have mostly fallen out of use—last Beiram morning it was crowded however with sports and gamblers—but alas, the spirit of the olden time was not there, and the exhibitors seemed more like warriors afraid of their own shadow, than the descendants of those who fought and won Thrace.

Sheep in California.—The sheep in California, as well as in all the other parts of Spanish America, are of a bad breed, and their wool of the very coarsest quality: the whole seem to be exactly of the same kind. It is strange, that while in Spain the finest-woolled sheep in the world—the merinos—have so long existed, an inferior breed, producing the coarsest wool, should have been carried to their colonies. Perhaps the propagation of the merinos, like the grape, was discouraged or prohibited in the Americas, in order, as was the policy of the mother-country, to give the monopoly to the flocks of Estremadura, as well as to the vineyards of Catalonia. It is extraordinary, however, that some one should not have introduced into any of those vast countries a better breed, even in the time of the Spanish government; and still more extraordinary, that since the revolutions, which have removed all obstacles, no amelioration of this breed has taken place. There are large flocks of sheep in Chili; immense numbers on the table-lands of Mexico, which abundantly supply the capital with mutton; and myriads scattered over the middle or southern republics, all of which, as well as those of California, are of the same breed, and their wool invariably exceedingly coarse. It might be thought that in the tropical climates the temperature and other circumstances may have changed the quality of the fleeces; but in Upper California the latitude nearly corresponds with that of Estremadura, and in some parts exactly so; yet the quality of the wool is equally bad there as in the equatorial latitudes of Peru and Colombia. The British settlements of New Holland and Van Diemen's Land correspond with the latitudes of Chili and California. It is impossible to conceive a country more adapted to the breeding of sheep than Upper California; and if a good kind were introduced by intelligent breeders, the benefit would be incalculable.—*Forbes's California.*

The Bush-Rope.—A vine, called by the wood-cutters the bush-rope, on account of its use in hauling out the heaviest timber, has a singular appearance in the forests of Demerara. Sometimes you see it nearly as thick as a man's body, twisted like a cork-screw round the tallest trees, and rearing its head high above their tops. At other times three or four of them, like strands in a cable, join tree and tree, and branch and branch together. Others, descending from on high, take root as soon as their extremity touches the ground, and appear like shrouds and stays supporting the mainmast of a line-of-battle ship; while others, sending out parallel, oblique, horizontal, and perpendicular shoots, in all directions, put you in mind of what travellers call a matted forest. Oftentimes a tree, above a hundred feet in height, uprooted by the whirlwind, is stopped in its fall by these amazing cables of nature; and hence it is that you account for the phenomenon of seeing trees, not only vegeting, but sending forth vigorous shoots, though far from their perpendicular, and their trunks inclined to every degree from the meridian to the horizon. Their heads remain firmly supported by the bush-rope; many of their roots soon refix themselves in the earth, and frequently a strong shoot will sprout out perpendicularly from near the root of the inclined trunk, and in time become a fine tree.—*Waterton's Wanderings in South America.*

African Sheep.—The African sheep generally are covered with fur or hair, instead of wool: and when these skins are properly cleaned and dressed, and a number of them sewed together, they form a much warmer covering than could be made from any other materials. The boors, who are enabled by their immense flocks to select only such as have a smooth fur, obtain a handsome *kombaars*, or coverlet, so unlike what a European would imagine for sheep skins, that many persons would not even guess from what animal it was made. Those which I have brought to England have often been viewed as the skin of some unknown animal. Few *furs* can be more beautiful than the selected skins of lambs thus prepared; and if prejudice did not stand in the way, I think they might supplant many which are seen in our furriers' shops. Such a branch of commerce might prove not unimportant to the colonists or to the colony in general; it might open a new source of profit, and turn to better account those innumerable flocks, for the rearing of which the greater part of the Cape of Good Hope seems by nature peculiarly adapted. Since the Cape, it seems, is not so fortunate as to possess a climate and herbage, like New South Wales, suited for the growth of the finest wools, it may prove equally favoured in having such as to give to its sheep a soft and useful fur.—*Travels in Southern Africa, by W. J. Burchell.*

Savage Life.—Owing to the late unsettled state of the country, the present is a time of great distress. Many hundreds of people are living in the bushes on roots, without any fixed habitation, and almost driven to desperation from extreme distress. In riding a few miles, Mr. Painton counted above three hundred people seeking roots for food: there are a great many eatable roots which will support life, but they are not very nutritious; they cause the people's bodies to swell to an enormous size, and the striking contrast between their emaciated limbs and swollen bodies is very painful to behold. In consequence of this scarcity of food, many men are driving from their kraals their least-valued wives, and the old and infirm, who cannot go far to seek roots, are left to starve. A great many people, especially women, come every day, hoping "to be picked up." We do what we can for the most distressed objects, but our stock of food will require very good management, and some self-denial on the part of ourselves and people, in order to make it hold out until the harvest-time, which is yet six weeks or two months off. . . . Three weeks ago, Faku's sister-in-law died; four persons were immediately tortured, and then beaten to death by sticks, for having caused her death by witchcraft. The charge was substantiated by the following evidence: "The poor creatures had been seen to wave their hands as they passed by the sick woman's kraal." Six weeks after a great captain died near the Umgazi; six persons were tortured and then burnt to death, on the same charge, on similar evidence: the witch-doctors pretended to find a piece of wood called chaka buried in their kraal, which, as it rotted, would cause the deceased to rot away: they were accused also of having burnt a lizard in their garden, in order that the deceased might have no corn to eat, and so die of hunger. In addition, John Burton, my interpreter, informed me, "that on his return from Butterworth (to which place he accompanied me when I went to the district meeting), he arrived in the evening at a kraal near the Bashee, and found the place in great confusion. On inquiring the cause, he learned, that food being scarce, the people had buried a child of seven years old alive, because they did not like to see it starve before their eyes: the grave being not very deep, and the soil light, the child struggled hard, and its crying was heard by the mother, whose feelings prompted her to dig the child up again: the people were holding a consultation as to the propriety of burying the child again. John Barton reasoned with them, gave up the little food he had, and the people promised to let the child live.—*Steedman's Wanderings in South Africa.*

THE HISTORY OF A COTTON GOWN.—No. I.

THE habitual use of the things which surround us leads to two very opposite effects in different instances: in some, we become familiarly acquainted with almost every circumstance connected with them; while in others, the very familiarity with them in their complete state makes us forget or neglect the steps by which they arrived at it. It is probable that the *materials of clothing* lie in the latter predicament. If we say that nineteen-twentieths of such materials have originally had the form of slender fibres, and have once possessed either animal or vegetable existence, we shall perhaps not be far from the truth; and yet such a statement would excite surprise in many. Our cottons, calicos, broad-cloths, worsteds, velvets, merinos, silks, linens, and all the extensive varieties of each of them, are prepared from one or other of *four* substances, viz.: the short fibres contained in the seed-pod of the cotton plant; a glutinous fibre elaborated from the body of the silk-worm; the woolly fibres which cover the back of a sheep; and a sort of fibrous bark covering the stem of the flax-plant. All these fibres, of which two kinds are procured from the animal and two from the vegetable kingdoms, are worked up by man into a fabric or extended substance, from which garments of every form and size can be made, and of a texture varying from that of a gauze veil to that of the thickest garment for rough weather. We will, on the present occasion, select one of these four classes of materials, viz., *cotton*, and endeavour to convey a general notion of the processes by which it acquires the forms so familiar to us.

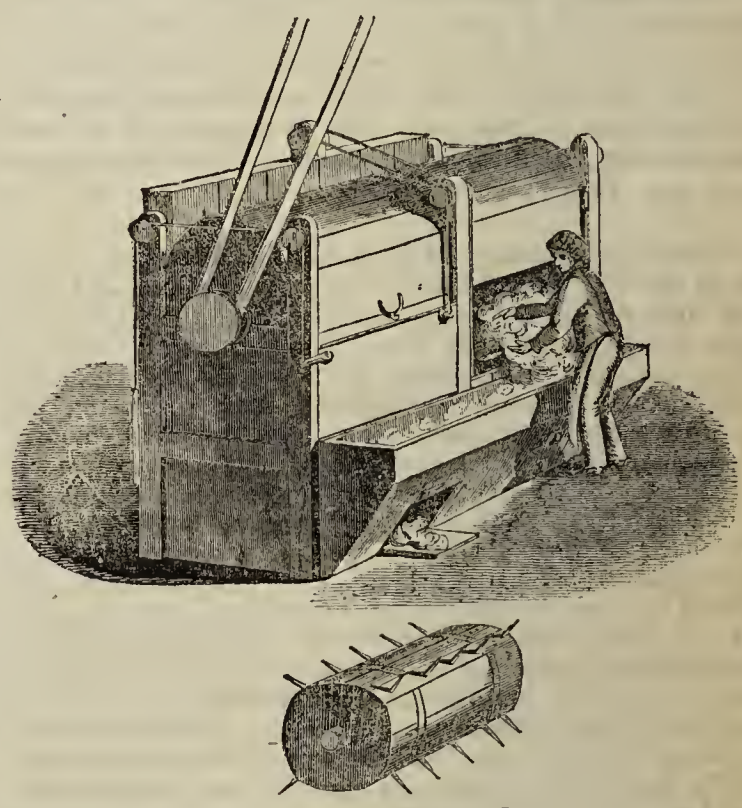
The reader, by referring to 'Penny Magazine,' vol. i., p. 156, will find a description of the cotton-plant, and of the manner in which the cotton is gathered, partially cleaned, compressed, and packed in bags for shipment. We will take up the subject in continuation, and suppose the bales of cotton to be safely landed at Liverpool. As Manchester is the great seat of our cotton manufacture, Liverpool, the nearest port to it, has become the principal place at which cotton is landed from foreign countries. From thence it is conveyed to Manchester on the railway connecting the two towns, and placed in the hands of the manufacturers. Of the extent to which this intertraffic is carried on, we may perhaps have something to say hereafter.

On opening the bale, then, the materials for our cotton gown are found to consist of whitish fibres, matted and clotted together in consequence of the severe pressure to which they have been subjected. But in order that the fibres may be united into one continuous thread or *yarn*, with which the weaver is afterwards to work, it is indispensable that they should be disentangled and straightened as much as possible. For this purpose the cotton is spread out, and subjected to a great variety of processes. In the first place, it must be *sorted;* for not only do cottons of different countries differ in quality, but that kind which is required to form the *warp* (or the long threads) of a piece of cloth is somewhat different from that selected for the *weft* (or cross-threads).

When the cotton is sorted, a task usually performed by women and children, it is then disentangled and freed from seeds and impurities by one or more of several processes called *cleaning*, *picking*, *scutching*, *willowing*, *blowing*, &c., some employed in one factory, some in another. The finest cotton is generally opened and picked out by hand-labour of women and children. It is placed on a table covered with a kind of net or meshwork, and, after being lightly beaten with slender rods, the knots and other impurities are removed by the fingers. This is called *picking*. Another method is by *scutching*, in which the cotton, after being spread out on an elastic table, is beaten by a series of parallel rods, by which the clotted fibres are disengaged, and the cotton seeds and other impurities fall through the open meshes of the elastic table. But the most general mode of effecting the first

[Picking Cotton.]

disentanglement and cleansing of the cotton is by a machine called the *willow*, represented in the annexed cut. A cylinder (seen separately in the lower part of



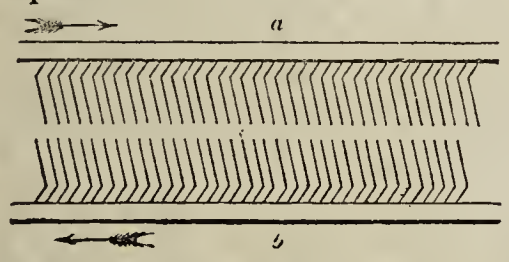
[Willowing Machine.]

the cut) has several teeth or spikes on its surface, and it revolves inside the machine in near communication with other spikes. A door is opened, and a boy puts in an armful of cotton, and closes the door again. The cotton is then thoroughly disentangled by being caught between the teeth during the rotation of the cylinder, and the seeds and impurities fall through a kind of sieve to the bottom of the machine. After it has been worked about for a few seconds, the boy opens the door, removes the cotton which has been disentangled and cleansed, and puts in a new supply. The inferior cotton wools are at the present day frequently *willowed* by a remarkable machine, which feeds itself, or draws in the cotton from a sort of stage placed close to it, thoroughly disengages it during the passage down or through the machine, and finally discharges it in a fine fibrous state at the bottom.

When the cotton has, by either of these modes, been disentangled and partially freed from impurities, it is subjected to the processes of *batting* and *blowing*, the object being to loosen still more the fibres of cotton, and to carry off the remainder of the dust through sieves. The batting (or beating) is produced by flat bars, carried rapidly round, which strike with their faces against the cotton fibres; while the blowing (or sifting) is effected by a sort of blowing-machine, or revolving fan, which removes the dust from the cotton. Where the very finest cotton (called *sea-island* cotton) is used, batting and blowing are often dispensed with.

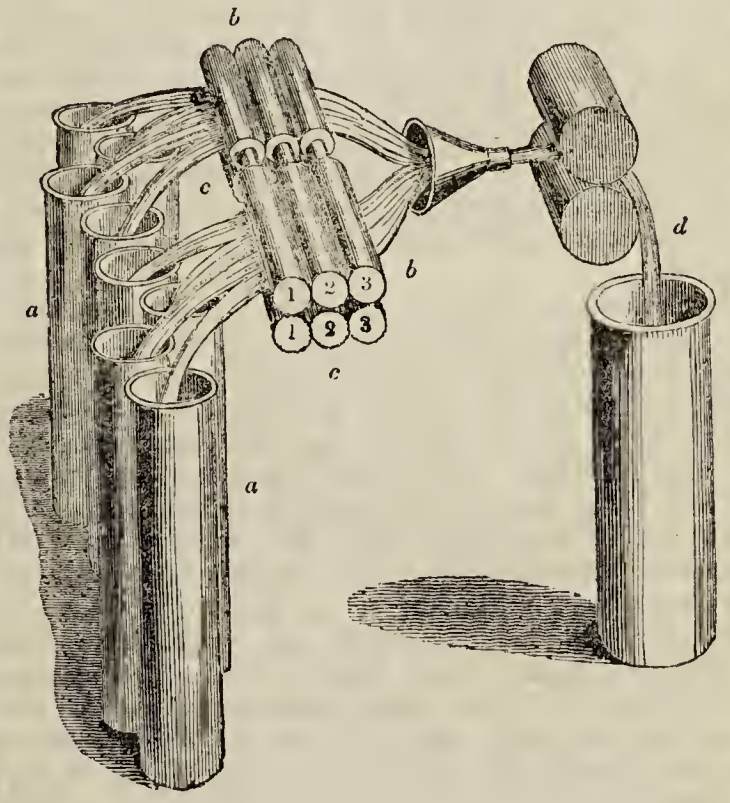
The reader must now bear in mind, that what has been

done to the cotton has *disentangled* and *cleansed* it, but not *straightened* the fibres; to effect this is the object of the next process, called *carding*. We all know how easily and effectually the hair may be straightened by the use of a comb or a brush. Now however intricate the cotton-manufacturer's *carding-engine* may be in appearance, its action is in reality midway between that of a comb and of a brush. A number of wires, formed and bent in a precisely similar manner, are inserted into a frame or block at one end, and present their sharp points at the other. This forms a kind of wire-brush; and upon being placed with the wires uppermost, a little cotton placed upon their points, and another similar wire-brush laid on the cotton, the movement in opposite directions of the two brushes will *brush* or *comb* out the the fibres of cotton, and lay them in a parallel and smooth form. This mode of action will be clearly understood from an inspection of the annexed little cut, which may



be considered as representing a profile or section of the brushes. If some cotton be placed on the wires of the lower brush (*b*), the upper brush (*a*) be laid upon it, and both brushes be moved in the direction of the arrows, it is easy to comprehend that the teeth or wires will straighten and make parallel the fibres of cotton. This operation is called *carding*, and the two brushes are termed *cards*. Originally the cards were employed nearly in the form here represented; but about seventy or eighty years ago, the cotton-manufacturers, particularly Mr. Peel (the grandfather of the present baronet), Mr. Hargreaves, and Mr. Arkwright, succeeded in fixing the cards to the surface of a cylinder, and to a concave surface applied close to it. By making the cylinder revolve continuously, the cotton, which is placed upon its teeth, becomes combed out or carded in a very complete manner. By subsequent improvements made in those cylinder-cards, not only are the cotton fibres combed out straight, but they are at the same time collected together in a narrow flattish roll, called a *sliver*. The fibres of this sliver have just coherent strength enough to hold together. It will then be understood that the operation of *carding* produces three different changes in the appearance of the cotton: the first is, to comb out and parallelise the fibres; the second, to collect it into a sort of sheet so exquisitely fine as to have obtained for it from one writer the figurative title of "woven wind;" and the third, to collect it into a small narrow sliver, midway between a ribbon and a roll in appearance. The carding-engine of modern days, by which all this is effected, is an exceedingly elaborate machine. The cards contain usually about twenty teeth to an inch in length.

But delicate and beautiful as is the effect produced by the carding-engine, the fibres composing the slivers of cotton have still much to go through before they will be in a fit state for the spinners. In the first place, though the cards have straightened most of the fibres, they have had the effect of *doubling* some of them by catching them in the middle: these doublings must be rectified. Again, although the fibres are arranged tolerably parallel by the carding-engine, yet they are not sufficiently so for subsequent purposes. The sliver, likewise, although delicate, contains too many fibres in thickness: one hundred feet of it contain nearly one pound of cotton. To remedy all these defects is the office of the *drawing-frame*, one of the most beautiful of Arkwright's inventions. It straightens the doubled fibres; it lays them as parallel to one another as possible; it equalises the quality of the cotton, by uniting many slivers into one, so as mutually to correct each other's defects; and lastly it draws out and elongates the spongy slivers or ribbons, so as to make them both narrower and thinner. All this is effected by drawing the sliver successively between three pairs of rollers, the two forming each pair being kept in close contact. The pairs are arranged side by side, so that after the sliver has passed between one pair, it is seized and forced through the second pair, and afterwards the third. Now if all these rollers revolved with equal velocity, the only effect produced on the cotton would be to flatten or stretch it out; but if the second pair revolve faster than the first, and the third faster than the second, it occasions the cotton to be *elongated* or *drawn out*. The second pair of rollers have a tendency to catch the fibres faster than they are liberated from the first pair, and therefore elongate them to make up the deficiency; the third pair act in like manner. And the very act of pulling or drawing the fibres in this way, also has the effect of straightening and laying them parallel. So important to the subsequent excellence of the woven cotton did Sir Richard Arkwright deem this process, that whenever any defective work was put out of hand, he used to impress on his workmen the injunction, "*mind your drawings:*" no good yarn could be spun unless the *drawing* of the slivers of cotton were properly performed. If one single sliver were attempted to be drawn until the suitable parallelism of its fibres were effected, the ribbon would soon become so excessively attenuated as to break; this is one of the reasons why many slivers are united into one during the process of drawing. The annexed cut will sufficiently show the more important parts of the



[Part of a First Drawing-Frame.]

[In this and the following cuts, those portions only of the machine have been given which are essential to the demonstration of the principles on which the several operations are performed. *a, a,* eight 'tubs' filled with 'ends' of cotton; *b, b,* six smooth wooden rollers covered with leather; *c, c,* similar set of fluted iron rollers. Rollers 1 move two-thirds slower than 3; and 2, at an intermediate rate. From this it results that the 'last end,' *d,* contains the substance of 512 of the 'ends' first drawn.]

operation. Several slivers, passing from a row of cans or 'tubs' in which they are deposited by the carding-engine, are caught between three pairs of rollers revolving with different velocities; they are then all united into one, brought into a small space by passing through a funnel, slightly compressed between a pair of rollers, and lastly received in a can. The operation of drawing is generally performed several times in succession.

After the slivers of cotton have passed through the

drawing-frame, they go through the operation of *roving*. The object of this is, to draw them out to a greater degree of thinness, and at the same time to impart to them a slight degree of *twist*, sufficient to enable them to be wound on small pieces of wood called *bobbins;* for in their parallel state they are too weak to allow of their being wound. This is performed by machines of various forms, called the *revolving can-frame*, the *tube-roving frame*, the *bobbin and fly-frame*, &c., some of which are very complicated. The cotton now obtains the name of *roving*, and some of the rovings are so fine, that one hundred feet of them will weigh but eighty grains: the texture being uniform in every part.

We have thus traced the materials of our cotton gown through the processes of sorting, picking, beating, carding, drawing, and roving. The next paper will introduce us to the labours of the spinner.

THE MENDIP HILLS, CHEDDER CLIFFS, AND THE CAVES OF SOMERSETSHIRE.

THE Mendip Hills form rather an extensive range of uplands, for mountains they can scarcely be called, in the north-east division of Somersetshire. The principal range extends from the neighbourhoods of Banwell and Compton Bishop towards the west, or from within six or eight miles of the Bristol Channel, to the vicinities of Crosscombe and Ashwick eastward, or, as some will have it, to a much greater extent, since the eastern extremity does not appear ever to have been accurately defined, some of the uplands stretching away into Wiltshire. The principal range, or that included within the limits here mentioned, varies from eight to four miles in breadth, while the length may be estimated at about twelve or fourteen miles. The elevation, though rarely exceeding six or seven hundred feet, is quite sufficient to produce a change of both soil and climate, and hence also a change in the productions of nature The mineral productions are various, among which may be enumerated lead, copper, and calamine, the last of which is worked to some extent, particularly in the neighbourhood of Shipham.

In most cases, except in the ravines that run up into the uplands, the ascent of the Mendip hills from the lowlands on either side is pretty abrupt, indeed in many cases particularly so. Except in a few situations, there is little wood on the sides of these hills, they being for the most part bare and covered with a poor and scanty herbage. The summits are partially enclosed and cultivated, but in some places there are extensive tracts of unenclosed common lands. A few patches here and there are covered with heath, but for the most part short natural grasses and mountain-mosses are the product of the uncultivated portion of the Mendip hills. The upland or hill farms, as they are called, are better calculated for grass than for grain, although many of the farmers of late years have turned their attention more to the raising of grain than formerly; but, owing to their elevated situation, in backward seasons the crops rarely get thoroughly ripe before the early frosts come on. These hills afford middling pasture for sheep, and to this purpose unenclosed parts are mostly applied.

From the top of the Mendip hills the views are various and extensive. Looking westward on a clear day, the whole intermediate country towards the Bristol Channel is embraced; the Channel itself, from opposite Bristol as far westward as North Devon, with its islands (or holmes); and beyond that æstuary, the coast of South Wales, including a considerable extent of Monmouthshire and Glamorganshire, interspersed with cultivated fields, whitened cottages, and backed by mountains in the extreme distance, completes this splendid picture. Eastward the view is nearly as extensive, for it is only terminated by the hills bordering upon Dorsetshire and the western division of Wiltshire. The city of Bath cannot be seen, from its low and peculiar situation; but Wells is almost in the immediate foreground; Shepton Mallet, somewhat more distant, and Frome more distant still, but lying within the confines of Somersetshire. Few districts of country present a more luxuriant aspect than the one under observation, since it embraces by far the richest district of the fertile county of Somerset. No great road crosses these hills, except the road from Wells to Bristol, and that is of a secondary class, so that few travellers, except those who go for the express purpose, have opportunities of gazing upon the varied and splendid views afforded from the different summits of the Mendip hills.

Thus far the general features of the Mendip hills have been discussed; but besides these, they possess other objects of attraction, amongst which are Chedder Cliffs, and the romantic and curious caves that have been discovered in several distinct sections of this hilly region. The little town of Chedder (which gives name to those cliffs) is situated close under the south-west brow of the Mendips, adjoining an extensive tract of level luxuriant meadows, and has long been noted for its cheese, sold in the markets under the popular name of Chedder cheese. Formerly Chedder was a market-town, but although it has a neat market-cross, and a fine old parish church with a beautiful tower, the market has fallen into disuse; and all that Chedder is noted for at present are its cheese, its paper manufactures, and its cliffs, including its caves and springs of beautiful water.

The town, which contains about two hundred houses, is situated very romantically: a portion of it is close to the mouth of the cleft or fissure in the side of the prominent hill where these famous cliffs commence. The chasm, which runs across the south-west or southerly ridge of hill, extends in a north-easterly direction for more than a mile, being, however, exceedingly serpentine, when it slopes away in gentle declivities, one valley diverging towards the right hand and the other towards the left. Near the entrance into the passage through this chasm are several copious springs of pure water, which, almost immediately uniting, form a river of respectable size; and, before it has run a course of more than a few hundred yards, it affords admirable water-power to five or six mills, three or four of which are paper-mills, and the others grist-mills. At one period a dozen mills were in operation at this place, the whole of them driven by this new-born but impetuous torrent. After the Chedder, for so this stream is named, has wound its way for a considerable distance through the adjoining level meadows, it falls into the river Axe.

These cliffs probably have no parallel in the whole island of Great Britain. Immediately above the springs of water already spoken of, the noise of which, falling over ledges of rocks, tends greatly to increase the general excitement, the chasm becomes both narrow and exceedingly winding; and although a road has been opened through this pass, and thence across the whole breadth of the Mendip range, the proximity of the walls of rock is in some places so close as to leave scarcely room for two wheel-carriages to pass each other. The rock is composed of various species of limestone. In some places it is exceedingly hard and ponderous, and of a dark colour, containing iron to a considerable extent; while in other situations a coarse species of marble presents itself, traversed with veins of dusky red and brown. Pursuing the winding road for some little distance, the cliffs rise on either hand in the most singular and picturesque forms, some of them being nearly 800 feet high, and terminating in craggy cones and pinnacles. Several of the rocks on the right hand are perpendicular, or nearly so, to the height of 400 feet, presenting to the astonished spectator the idea of stupendous walls and battlements of some vast castle or fortress. On the left the rocks are not quite so lofty, but some of them are equally grand, and, in two instances in particular, they hang over the road in

threatening aspect; while others appear separated from the main and solid body, and ready at every instant to descend on the heads of those that have the temerity to venture beneath them. In several instances the projections of the rock on one side stand out, as it were, opposite to corresponding hollows on the other, thereby strongly indicating that this terrific gap was first formed by some extraordinary convulsion of the earth, the brow of the mountain having been riven asunder. In most instances, these cliffs, as will readily be imagined, are wholly inaccessible to the most adventurous schoolboy or prying antiquary. In some places, however, it is singular to witness the face of these tall and apparently solid walls of rock, interspersed with here and there a hardy shrub, ivy, dwarf yews, and sundry other sorts of natural productions.

Immense numbers of jackdaws are constantly flying about the middle and upper sections of the cliffs, for here it is that they build and breed in the most perfect security. Hawks too of different kinds make their aeries in these rocky fastnesses; and the visitor to this sublime scenery may constantly witness them sailing on steady wing in mid air, in all the security of an uninhabited region.

In the sides of the Chedder cliffs there are several caverns, some of which are of considerable magnitude, and contain many curious stalactical productions, spars, crystallizations, &c. In the large chambers, into which two of the caves in particular expand, the scene, when lighted up, is grand and awfully sublime; while the echoes and reverberations, even of the human voice, are truly astonishing. Indeed it is very probable that a great number of caves exist in this rocky defile through the hills, many of which would be discovered were the rubbish and rocky fragments, the accumulations of ages, cleared away from the bottom of the various precipices. One of these caves has been explored to a distance exceeding 300 yards, the general direction being north-east; while another, but recently discovered, and at the very commencement of the rocks, has also been explored to a very considerable distance.

Several small huts or cottages, perched against the wall of rock, allowing just sufficient space for the road to pass them, are seen at the entrance into the very gorge of this romantic chasm. These are inhabited by guides, or persons who are eager to undertake to conduct strangers to the most remarkable parts of the caves, as well as to those other parts of the cliffs that are accounted the most worthy of attention. They also collect specimens of the various sorts of stone, &c., which they do not fail to exhibit to every one that visits the cliffs, at the same time offering them for sale, and, like guides to curiosities in general, often render themselves rather obtrusively importunate.

Since the road that traverses the foot of these cliffs is exceedingly winding, and since no two sections of the pass resemble each other, the view is consequently ever varying, so that the place affords an immense variety of views of a picture well deserving the attention of such as have a taste for the sublime beauties of nature.

Nearly fifty years ago a cave was discovered on the opposite side of the Mendip hills to that on which the Chedder cliffs are situated. This cave is near the bottom of a deep dell that runs for a mile or two up into the mountain, and near to the village of Burrington, thirteen miles south-west of Bristol. In this cave many skeletons were found, some of which were of the human race, and in a tolerable state of preservation; whilst others were the skeletons of animals that were not known ever to have existed in this island. Several were perfectly imbedded in stone, some of which are now exhibited in the British Museum. About a mile west of the Burrington cave, and immediately under the brow of the Mendips, a large and beautiful spring gushes forth, covering a bed of from twenty to thirty feet in width close to the well-head, and then gliding quietly away through the plain below, on its way to the Bristol Channel.

The cave of Banwell, about a mile from that village, has been more visited since its discovery than either of those already spoken of. The opening to this cave is near the western extremity of an oval-shaped hill, and in the pleasure-grounds attached to a summer retreat belonging to the bishop of Bath and Wells. There are, in fact, at present two caves, both of which are within the very precincts of this episcopal residence. The main cave is entered within a few yards of the bishop's rural residence (which is nothing more than a tasteful thatched cottage of moderate size, situated on one extremity of a barren ridge, which money and good taste have converted into beautiful pleasure-grounds), and after several descents, windings, and openings into extensive chambers, is terminated evidently not far from the opposite side of the hill. The other cave was discovered in attempting to open a new entrance into the larger one, in order that strangers coming to explore it might not intrude so immediately upon the privacy of the bishop's cottage, although the entrance even to this latter cave is in full view of the windows of the drawing-room, and not more than forty yards distant from them. In digging away the loose earth between two rocks that presented an opening in the proposed direction, when the workmen had excavated to the depth of twelve or fifteen feet, they discovered an immense quantity of bones, that had been deposited there, as has since been stated by geologists, before the time of the Flood. A considerable portion of these bones have belonged to deer, elk, and animals of this class; but there are also the bones of wolves and bears, as well as those of the buffalo and elephant. Vast quantities of these bones have been taken away, a splendid collection remains in the hands of the proprietor of the cave, and yet there are large quantities remaining, walled up on all sides of the cave, and many more that yet remain mixed in the soil, that, it is presumed, has been washed into the lower part of the cavern, which a little more labour would recover from their resting-place of several thousand years. Except these bones, this latter cave presents nothing remarkable; indeed it extends but a short way under the hill in the direction of the larger one; for at the extremity of the den of bones a solid rock presented itself, so as completely to exclude the desired object of finding an easy communication with the principal cave by the route thus attempted to be opened.

RELIGIOUS EMIGRATION.

In the Tyrol, under the dominion of Austria, a number of families in Zillerthal had recently become converted to Lutheranism, and, agreeably to the constitution, had, in 1826, applied to be relieved from attendance at Catholic churches, and to have a priest of their own persuasion allowed to attend them. For several years this had been evaded, but in 1837 they received permission to expatriate themselves, and the king of Prussia agreed to receive and provide for them in his dominions, through the mediation of our late king William IV. The following is an interesting account of their arrival at their new settlement in Silesia, published in a translation by J. B. Saunders, of an account of them by Dr. Rheinwald, of Berlin:—

"At the mountain village of Michelsdorf, in the circle of Landshut, the exiles first trod their new father-land. They received their first welcome on the 20th of September, 1837, from the Protestant pastor Bellman, who was followed by the greater part of his flock. The train consisted of about a hundred and twenty persons. At its head advanced the fathers and mothers, tall and well-proportioned figures, wearing the well-known Tyrolese hat, and carrying umbrellas; otherwise habited in the simple costume of their country. Among all, it was easy to perceive that their dress had been newly provided for the journey. Earnest and still the procession moved forward; even the spectators, penetrated with sympathy, observed a deep silence: firm, tranquil resolution was expressed in the countenances of the

men, humble resignation in those of the women. These were followed by ten or twelve wagons carrying the aged and sick, women and children, as well as the most necessary articles of their moveable property. Then there came several small two-wheeled cars, drawn by their owners, containing their books, &c.

"About noon, on the twenty-third of September, the second train arrived, consisting of two hundred and eighteen persons, among whom was John Fleidl. They had traversed, in twenty-three days, about ninety German miles.* As during the last few days there had been an incessant rain, the travellers here halted some hours, in order to recruit themselves for the mountain-pass, and the remaining six miles of their journey. The countenances of all indicated the greatest exhaustion, and only the children were cheerful and joyous. Pastor Bellman stepped into the midst of the pilgrims, who, young and old, crowded round him with tears in their eyes, endeavouring to reach his hand and catch a glimpse of his countenance. Every eye was fixed upon him, glistening with emotions of joy and gratitude. One party that was encamped near the church having procured it to be opened, some of them entered: in silence they ranged themselves before the altar, when presently one of them perceived and drew the attention of his companions to a portrait of the king: with a general shout of the highest transport, they all rushed towards the picture, contemplating it with eyes beaming with tears of joy—it was, indeed, the likeness of one who, by his royal favour, had caused their gladness at that happy moment.

"On the evening of Saturday the 30th of September, the third division arrived, with six wagons and sixty-five persons. As the following day was to be the harvest festival, they were invited here to partake its rest. The overseers of the parish anxiously provided for their accommodation, and several of the Catholic householders also offered them a ready welcome. On the Sunday morning, they all appeared in the church, whither they were conducted by the clergy; they likewise attended the afternoon service, and all the other holy exercises. At two o'clock the next morning they passed through Hermsdorf, where the Protestant inhabitants prepared for them breakfast, on their way to Schmiedeberg.

"A few days later a fourth division followed, consisting of three families and other individuals, about thirty in number, who had not before been able to dispose of their farms and cattle, the whole followed by a throng of foot-passengers. Pastor Bellman relates that in his conversations with the travellers, 'they expressed their thankfulness to God; that, with the exception of some trifling ailments, they had all enjoyed perfect health; and that, notwithstanding the great number of those who were aged and infirm, they had not, contrary to the predictions of some of their friends, lost a single individual on the journey. There were among them many families of whose members not one remained behind, yet not a few in which parents from children, children from parents, and brothers and sisters, had been parted. Their separation must, indeed, have been in the highest degree painful, and gladly would they have remained in their beloved fatherland, had not their ardent desire to be able to serve the Lord, in the liberty of their own convictions, overborne all other considerations.'"

* A German mile is equal to four and a half English miles.

Results of Desultory and Continuous Labour.—The young natives of the interior of Australia usually carry a small wooden shovel, with one end of which they dig up different roots, and with the other break into the large ant-hills for the larvæ, which they eat: the work necessary to obtain a mouthful even of such indifferent food being thus really more than would be sufficient for the cultivation of the earth, according to the more provident arrangements of civilised men.—*Three Expeditions into the Interior of Eastern Australia, by Major Mitchell.*

MONTHLY CALENDAR.—JANUARY—First Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock bef. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h. m.		h. m.	h. m.
1 W	1	*Circumcision.*	8 9	3 37	3 59	26·4	5 m 29	0 a 46
2 Th	2	. . .	8 9	4 5	4 0	27·4	6 39	1 19
3 F	3	. . .	8 8	4 33	4 1	28·4	7 40	2 7
4 S	4	. . .	8 8	5 1	4 2	●	3 28	3 8
5 *Su*	5	2 *Sunday after Christm*	8 8	5 29	4 3	0·6	9 4	4 20
6 M	6	*Epiph.*, Old Christ. Day	8 8	5 56	4 4	1 6	9 31	5 39
7 Tu	7	. . .	8 7	6 22	4 6	2·6	9 50	6 59
8 W	8	. . .	8 7	6 48	4 7	3·6	10 5	8 19
9 Th	9	. . .	8 6	7 14	4 8	4·6	10 17	9 39
10 F	10	. . .	8 6	7 39	4 10	5·6	10 29	10 59
11 S	11	Hilary Term begins.	8 5	8 3	4 12	6·6	10 41	morn.
12 *Su*	12	1 *Sunday after Epiph.*	8 5	8 27	4 13	☽	10 54	0 21
13 M	13	Cam. Lent Term beg.	8 4	8 50	4 14	8·6	11 12	1 47
14 Tu	14	Oxford Lent Term beg.	8 3	9 12	4 16	9·6	11 34	3 16
15 W	15	. . .	8 2	9 34	4 17	10·6	0 a 8	4 45
16 Th	16	. . .	8 2	9 55	4 19	11·6	0 58	6 8
17 F	17	. . .	8 1	10 16	4 20	12·6	2 8	7 15
18 S	18	. . .	8 0	10 35	4 22	13·6	3 32	8 3
19 *Su*	19	2 *Sunday after Epiph.*	7 59	10 54	4 24	○	5 1	8 34
20 M	20	. . .	7 58	11 13	4 25	15·6	6 28	8 55
21 Tu	21	. . .	7 57	11 30	4 27	16·6	7 50	9 10
22 W	22	. . .	7 56	11 47	4 29	17·6	9 7	9 23
23 Th	23	. . .	7 54	12 3	4 30	18·6	10 22	9 34
24 F	24	. . .	7 53	12 18	4 32	19·6	11 35	9 45
25 S	25	*Conversion of St. Paul.*	7 52	12 33	4 34	20·6	morn.	9 56
26 *Su*	26	3 *Sunday after Epiph.*	7 51	12 46	4 35	☾	0 48	10 9
27 M	27	*D. of Sussex born* 1773.	7 49	12 59	4 37	22 6	2 1	10 25
28 Tu	28	. . .	7 48	13 11	4 39	23·6	3 14	10 46
29 W	29	. . .	7 47	13 23	4 41	24·6	4 25	11 16
30 Th	30	*King Charles I. Martyr.*	7 45	13 33	4 43	25 6	5 30	11 58
31 F	31	Hilary Term ends.	7 44	13 43	4 44	26·6	6 24	0 a 54

Meteorological Averages.	
Barometer.	Ins.
Mean height	29·921
Highest .	30·770
Lowest .	28·890
Hygrometer.	°
Mean dew-point	34·3
Highest .	59
Lowest .	10
Mean dryness	1·8
Mean greatest do. of day .	3·5
Greatest dryness	19
Thermometer.	
Mean temperature	36·1
Highest .	52
Lowest .	11
Radiation.	
Mean great. of Sun	4·4
Greatest power	12
Mean cold of terrest.	3·5
Greatest ditto	10
	Ins.
Mean qty. of rain	1·483
Mean of evap.	0·413

Table of the Winds.

	Days.	Dew-P.
N. .	3½	31°·5
N.E. .	4½	27 ·5
E. .	1½	23 ·5
S.E. .	2½	34 ·5
S.	1¾	39
S.W. .	6½	42 ·5
W. .	6¼	37
N.W. .	4½	32

SUNDAY LESSONS.

Jan.		MORNING.		
5	2 Sun. aft. Ch.	Isaiah	41.	Matt. 4
6	Epiphany .	„	60.	Luke 3 [to v. 23
12	1 Sun. aft. Ep.	„	44.	Mat. 10
19	2 „	„	51	„ 17
26	3 „	„	55	„ 23

Jan.	EVENING.		
5	Isaiah	43...	Rom. 4
„ 6	„	49...	John 2 to v. 12
„ 12	„	46...	Rom. 10
„ 19	„	53...	1 Cor. 1
„ 26	„	56...	„ 7

THE MOON'S CHANGES.

New . . . 4th day, 9h. 20m. aft.
First Quart. 12th day, 7h. 58m. mn.
Full . . . 19th day, 0h. 34m. mn.
Last Quart. 26th day, 1h. 34m. aft.

Day of Mth.	Length of Day.	Day's decrease	Day break.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	
1	7 50	0 5	6 3	6 5	16′ 17″
6	7 56	0 11	6 2	6 9	16 17
11	8 7	0 22	5 59	6 14	16 17
16	8 17	0 32	5 55	6 21	16 16
21	8 30	0 45	5 51	6 28	16 16
26	8 46	1 1		6 36	

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HORSE ARMOURY IN THE TOWER.—I. THE NORMAN CRUSADER.

[The Norman Crusader.]

IN a former volume of the 'Penny Magazine' (vol. v., pages 249 and 297) there appeared an account, historical and descriptive, of the Tower of London. To that we must refer for any information required with respect to the building itself; our present purpose is to describe the Armoury, and to point out the sources whence the interest which attaches to this portion of the building is derived. There are three apartments, in and adjoining the "White Tower," or keep, in the centre of the fortress, devoted to the reception and conservation of arms and armour: one of these, called the "Small-arms Armoury," contains a large collection of arms of the present day, all carefully arranged and ready for immediate use; the others, designated "The Horse Armoury" and "Queen Elizabeth's Armoury," are repositories of an extensive collection of ancient armour, weapons, and various machines used in war.

Considered as an exhibition, this portion of the Tower is perhaps the most attractive of any within its walls, but few of its many visitors leave it with any other feelings than those of a vague sense of gratification experienced from the novelty and glitter of the exhibition. Yet it may boast a deeper interest. To the historical student, who has traced in the chronicles of his country the progress of its society—who has made himself acquainted with the habits and manners of his ancestors—who has marked the struggles of religion, of learning, and of taste, in their attempts to humanize a barbarous age—who has mourned over the misery or joyed in the success of his country;—to him this collection will prove a source of the most deep and permanent interest. Each relic of a bygone age will serve to recal the times in which it was manufactured, and its original owner will appear to the mind's eye as again wearing his armour, or wielding the falchion that now hangs peacefully on the wall. Even should he be unknown, we clothe him with the attributes of the class in which we may imagine him to have moved, and, in an individual, fancy we behold the characteristics of a multitude. As this collection of armour has been arranged chronologically, and with great care, by Sir Samuel Rush Meyrick, the visitor is now enabled to trace, as it were by an index, the history of chivalry, and the progress of improvement in the science of war; and he will not allow the

historieal reminiseences thus conjured up by the influenee of association to depart from his mind, without dwelling on their relative advantages or disadvantages, or without attempting an estimate of their effect on the well-being of society and the happiness of mankind.

The "Horse Armoury," the more imposing portion of the colleetion, is contained in a gallery erected along the south side of the White Tower. The interior of this gallery is 149 feet in length and 33 in width. It is divided into two unequal parts or walks, the equestrian figures oecupying the centre. In front of the equestrian figurcs are others representing men-at-arms, bowmen, pikemen, &c., the remainder of the contents being weapons and portions of armour of different ages, but prineipally of the fifteenth, sixteenth, and seventeenth eenturies.*

Now let us direet our attention to the first figure in this collection, the Norman warrior, whose dress of chain mail, eomposed of minute iron rings joined together in the manner of network, is the oldest suit of armour in the collection. It is supposed to have belonged to one of the earliest crusaders, and to be upwards of 700 years old. Could it relate its adventures, what a varied tale would it unfold! A diary of the first ten years of its existence were alone worth a Jew's ransom! But sinee the reign of fairies has ceased, and inanimate objeets no longer hold converse with mortals, we must give up all expectation of such a revelation. Yet our thoughts revert to the times when it first saw service: its gallant wearer rises to our eyes; and although we know nothing of his history, yet, presuming him to have belonged to that numerous class of adventurers, or errant-knights, which the pages of romance have rendered as familiar to us moderns as a troop of our own horse-guards, we may in imagination trace his dubious career in camp and field, and follow his wanderings from country to country; now gay and joyous in some baronial hall, or, faint and worn with toil, seeking a poor refreshment in some rude hostelry; now prancing gaily along, surrounded by a score of loud and hearty comrades; now wearily paeing his solitary path through some unfrequented waste.

At the close of the eleventh century, to which the chain armour now before us may be referred, most European countries, although nominally monarehical, may be said to have consisted of a multitude of states presided over by prinees who ruled them despotically, and who aeknowledged little more than the titular superiority of their sovereign, and his right to require their military services.

In such a state, at this period of its history, was England. The Norman nobles had possessed themselves of the castles and estates of the Anglo-Saxons, and had each created around him a little principality in which his will was supreme, and over which the constitutional laws of the kingdom had little authority.

These petty sovereigns, the "barons of England," having aequired their property by the sword, and being united to one another only so far as each required the others' assistanee against combined attacks of a common enemy, were intent upon strengthening their resources, and were not scrupulous by what means their own power was inereased, or that of those whom they feared reduced. Thus, respecting no laws but those of force, they depended on the sword, which had aehieved their greatness, for the preservation of their power, and their own jealousies were sufficient to keep that sword in constant requisition. As eaeh baron inereased his power, he looked with an envious eye on the acquisitions of his neighbours, till he found means to join their possessions to his own; and the licenee whieh the violenee of the times had oeeasioned was sueh, that the murders and midnight onslaughts by which property was wrested from or secured to its possessors, were searcely noticed by any with more regard than as a passing storm, which roars for a time, subsides, and is forgotten by all but those injured by its severity. The Anglo-Saxon nobles who would not submit their allegianee to the Conqueror were deprived of their estates, and, as they lived perpetually in fear of having their lives sacrificed to the rage of their unprincipled oppressors, they were obliged to hide themselves in the depths of the extensive forests which at that time overspread the greater portion of England, and were compelled from neeessity to adopt the marauding habits whieh the Normans praetised from disposition.

Henee the peace of the whole kingdom was disturbed by the broils of the two raees, and if the Normans made themselves terrible by the enormity of their erimes, their despotic conduct, and the horrible punishments they were in the habit of inflieting on those who displeased them, their habits only heightened the rancour in which they were held by the Anglo-Saxons, who thus beeame more implaeable in their resentments and more determined to resist the sway of the Normans.

Those who were eontent to aeeept of feudal offiees under the proud barons by whom they were thus tyrannieally treated, or who bound themselves to support their oppressors in their warlike engagements, might obtain in their protection a temporary security from the violenee of other parties; but it was gained at the expense of that liberty and independenee whieh our old race, whether called by the name of Saxons or Englishmen, has ever prized, and might on the least pretext be withdrawn, and the unfortunate Saxon exposed, without means of defenee, to the tyranny of his oppressors.

William the Conqueror sueeessfully endeavoured to repress the lawless outrages of his nobles; but in the lieenee which Rufus afforded them, the long pent-up desires of the Normans burst forth, and in the time of Stephen, to whieh time we refer, they raged with uncontrollable fury.

Almost the only check on the violenee of the Norman barons was then vested in those knights-errant who, wandering about in search of adventures, always avowed themselves willing to aid the oppressed, sometimes only for the pleasure of the action, sometimes for the emoluments consequent upon sueeess. In those ages knights were the only part of the military who were completely armed, and being the only diseiplined and effeetive soldiery of the day, were held of sueh importanee, that they were invited by kings to their courts with profuse liberality. It cannot be denied, that when the government was weak and when there was no poliee, the institution or praetiee of knight-errantry was of great importance; and whether the motives of the knights were honours and renown, wealth, or the satisfaetion of redressing the grievances of the oppressed, the utility of the practiee might be proved from many instances.

But it is destructive of our ideas of the romanee of knight-errantry to know that these warriors were sometimes to be found oppressing instead of aiding the oppressed; being engaged often to defend the possessions gained by some rapacious baron, or to assist him in the acquirement of others. Thus, in the reign of John, one of these powerful depredators, as perfect a caitiff as the imagination of a romance writer ever portrayed, who was aecustomed to boast that he had assisted to burn above a score of monks in their church, and who, anointing his captives with honey, exposed them naked under a burning sun for insects to torment, is noticed by the historian of Malmsbury as having seized a castle and sent for knights from Flanders to defend it. Before, however, they arrived, a knight more gentle came to the relief of the district, attaeked the baron's castle, and put it out of the power of the baron himself to do any further mischief, by hanging him at his own gate.

* See 'Penny Magazine,' vol. v., p. 254.

To return to the subject which introduced these remarks, we would fain imagine the owner of this coat of mail to have been a knight who regarded his vows to aid the oppressed, the orphan, the widow, and the unprotected; he is called, in the 'Catalogue of the Armoury,' a Norman crusader, and we might hope that his visit to Palestine, the hallowed scene of those events held so dear to the professors of his faith, would have elevated his mind to a high standard of virtue, and rendered his actions correspondent to the vows he made when he assumed his spurs. But it has been said that of all wars the "holy wars" were the most "unholy," and many of those who returned from them did so with their minds and habits tainted with the voluptuous vices and despotic bearing of the inhabitants of the East. To those who have viewed the events of these times only through the medium of novels and romances, a peep at the reality, as exhibited in the pages of history, will unfold a very different, though not perhaps altogether an unexpected prospect.

Let us take off the iron coat of the knight whom we have pictured to ourselves as having taken a part in the violent actions of the times we have been describing, and let us view him, divested of the lustre of his deeds of arms, in his domestic relations, and witness his conduct in the ordinary affairs of life. Although it must be allowed that the Normans were more advanced in civilization and were more refined in their habits than the Saxons, whose rude manners they looked upon with contempt, they were still wanting in many of those higher qualities of mind, without which the most polite manners and punctilious ceremonials fail in their intended effect. They certainly, when they assumed their rank of knighthood, vowed to be governed only by the most pure and honourable principles, yet how frequently do we meet with instances in which their conduct is exhibited in the most censurable aspect: cruel without remorse, oppressing without cause, destroying without necessity, invading the rights of others, mixing in all the vices of the times, and yet amid all their errors laying claim to honourable motives, which, as it would be death to dispute, were seldom impugned.

The knights-errant of those times, as they had not the mercenary motives of those barons who, confining themselves to their homes, were intent only upon augmenting their power and estates by any means within their reach, had not such powerful inducements to disturb the purity of their vows, and were consequently more deserving of the esteem in which they would fain be held. Yet even they were sometimes found wanting; and when we consider their want of education, their imperfect knowledge of good and evil, and the tempestuous scenes in which they were engaged, we cannot think it extraordinary that they should somewhat deviate from the strict path of morality and virtue.

We have placed, in our imagination, the Norman warrior, who has given rise to these reflections, in this class; and, viewing him as such, we may form some idea of his wants as well as his acquirements. He could neither read nor write; had but a slender acquaintance with the most common elements of knowledge; was as much under the influence of popular superstitions as the despised Saxons; had but a very imperfect idea even of the religion for which he was ready to lay down his life or submit to the severest punishment; and although he could pity the sufferings of the poor and friendless, yet for a few empty words of praise, for the most worldly and fleeting distinctions, he would exert his whole soul to be among the first of those who should reduce others to the same state as that for which he had himself felt so much distress.

For his domestic life, he could live upon the most common food, and, although he affected the greatest delicacies, was frugal in his diet, and shunned the besetting vices of the Saxons, gluttony and drunkenness: he would laugh at the dress and rude habits of the Saxons, yet himself, with all his assumption of elegance, had no idea of a fork at his meals, cutting off his portion of meat from the spit as it was handed round to the company: he rose early, dined some hours afterwards, made a good supper (as it was then called, though in fact the meal which we now call dinner) at about five or six, and retired to bed shortly after sunset (unless when the pursuits of his uncertain life required him to postpone the hour of repose), his cloak, or a few rushes strewn on the floor or on a wooden bench, serving him for a bed.

We might greatly extend this sketch, did we not feel that it is time we passed on to other objects in the Armoury as much deserving our attention and perhaps of more importance.

Amusements of the Afghauns.—Most of their games, says Mountstuart Elphinstone, in his 'Account of Caubul,' appear to us very childish, and can scarcely be reconciled to their long beards and grave behaviour. Marbles are played by grown up men through all the Afghaun country and Persia. A game very generally played is one called *Khossye* by the Dooraunees, and *Cubuddee* by the Taujiks. A man takes his left foot in his right hand, and hops about on one leg, endeavouring to overset his adversary, who advances the same way; this is played by several of a side, and is more complicated than I have made it, but still a strange game for grown up men. Prisoner's base, quoits (played with circular flat stones), and a game like hunt the slipper (played with a cap), are also very common, as are wrestling, and other trials of strength and skill.

False Appearances of Prosperity.—But if we should look under the skirt of the prosperous and prevailing tyrant, we should find, even in the days of his joys, such allays and abatements of his pleasure, as may serve to represent him presently miserable, besides his final infelicities. For I have seen a young and healthful person warm and ruddy under a poor and a thin garment, when at the same time an old rich person hath been cold and paralytic under a load of sables and the skins of foxes. It is the body that makes the clothes warm, not the clothes the body; and the spirit of a man makes felicity and content, not any spoils of a rich fortune wrapped about a sickly and an uneasy soul. Apollodorus was a traitor and a tyrant, and the world wondered to see a bad man have so good a fortune, but knew not that he nourished scorpions in his breast, and that his liver and his heart were eaten up with spectres and images of death; his thoughts were full of interruptions, his dreams of illusions; his fancy was abused with real troubles and fantastic images, imagining that he saw the Scythians flaying him alive, his daughters like pillars of fire dancing round about a cauldron, in which himself was boiling, and that his heart accused itself to be the cause of all these evils. And although all tyrants have not imaginative and fantastic consciences, yet all tyrants shall die and come to judgment; and such a man is not to be feared, not at all to be envied. And, in the mean time, can he be said to escape who hath an unquiet conscience, who is already designed for hell—he whom God hates, and the people curse, and who hath an evil name, and against whom all good men pray, and many desire to fight, and all wish him destroyed, and some contrive to do it? Is this man a blessed man? Is that man prosperous who hath stolen a rich robe, and is in fear to have his throat cut for it, and is fain to defend it with the greatest difficulty and the greatest danger? Does not he drink more sweetly that takes his beverage in an earthen vessel, than he that looks and searches into his golden chalices for fear of poison, and looks pale at every sudden noise, and sleeps in armour, and trusts nobody, and does not trust God for his safety, but does greater wickedness only to escape awhile unpunished for his former crimes? *Auro bibitur venenum.* No man goes about to poison a poor man's pitcher, nor lays plots to forage his little garden, made for the hospital of two bee-hives and the feasting of a few Pythagorean herb-eaters.—*Jeremy Taylor.*

SHEERNESS DOCKYARD.

[Sheerness Dockyard, and First-rate Man-of-War lying off the Pier.]

IN the early period of British Naval History our kings had neither arsenals nor dockyards, and their only permanent naval force consisted of a small number of vessels which the Cinque Ports were bound by their charters to furnish to the crown at forty days' notice. When the number of these was insufficient for carrying on the war, other ships were hired from merchants at home, or from those of Dantzic, Hamburgh, Lubeck, Genoa, and other ports; and private adventurers also fitted out vessels at their own cost, and scoured the seas in search of prizes from the enemy. In the reign of Henry VIII. the Admiralty and a Navy Board were established, and the dockyards at Deptford, Woolwich, and Portsmouth were formed. In the reign of Edward VI. various important regulations were made for the civil government of the navy, which have formed the basis of all subsequent instructions to the officers to whose management its affairs have been committed. The chief officers appointed at the above period were, a Vice-Admiral of England, the Master of the Ordnance, the Surveyor of the Marine Causes, and several others, who were directed to meet weekly at their office on Tower-hill to consult together for the good order of the navy, and to report their proceedings once a month to the Lord High Admiral. The ships belonging to the crown, or provided by the civil department, formed only a part of the naval force employed in war down to the end of the seventeenth century. In the fleet which defeated the Spanish Armada there were 176 ships, with 14,992 men, and only 34 ships and 6225 men belonged to what properly constitutes a royal navy. It is, however, unnecessary to proceed further with this sketch.*

The dockyard at Sheerness, on the Isle of Sheppy, at the entrance of the Medway, was formed in the reign of Charles II. At first a fort was built to defend the entrance of the Medway, and in 1667 the works were strengthened. We were at this time at war with our great naval and commercial rivals the Dutch, and early in June they boldly entered the Thames, destroyed the fortifications erected at Sheerness, and sailed up the Medway as far as Upnor Castle. The thoughtless and profligate sovereign had applied the money which Parliament had voted for the pay of the navy, to his own pleasures; the streets were full of starving sailors, and only a few second-rate or third-rate ships were in commission, which were badly provided with the munitions of war. It is questionable if England had ever before been in so humiliating and degrading a position.

The Dutch fleet was commanded by the brave admiral De Ruyter, and consisted of eighty sail, and many fire-ships. They blocked up the mouths of the Thames and the Medway, and advanced as far as Chatham in one direction, and nearly to Gravesend in the other. The 'Royal Charles,' one of the best of our ships, was taken; and

* Nos. 384, 386, 389, and 412 of the 'Penny Magazine' contain papers on 'British Naval History.'

the 'Royal James,' the 'Oak,' and 'London,' all first-rates, were burned. Pepys, who was secretary to the Admiralty, says in his 'Diary,' "I did hear that there were many Englishmen on board the Dutch ships, speaking to one another in English, and that they did cry and say, 'We did heretofore fight for tickets—now we fight for dollars.'" The following passages from the 'Diary' illustrate the contemptible and wretched mismanagement of our naval resources:—"Several seamen came this morning to me to tell me that if I would get their tickets paid they would go and do all they could against the Dutch; but otherwise, they would not venture being killed, and lose all they have already fought for; so that I was forced to try what I could do to get them paid. . . . . And indeed the hearts as well as affections of the seamen are turned away; and in the open streets of Wapping, and up and down, the wives have cried publicly, 'This comes of your not paying our husbands; and now your work is undone, or done by hands that understand it not.'"

Some time before this, while the plague was raging in London, Pepys notes—"Did business, though not much, at the Navy-Office, because of the horrible crowd and lamentable moan of the poor seamen that were starving in the streets for lack of money, which do trouble and perplex me to the heart; and more at noon, when we were to go through them, for then above a whole hundred of them followed us; some cursing, some swearing, and some praying to us."

Had De Ruyter made for London at once, he might have burned all the shipping in the river; but while he was in the Medway, Prince Rupert threw up some strong batteries at Woolwich, and sank a number of vessels to block up the passage. At the end of June, the Dutch admiral sailed from the Downs, scoured the coast, and returned in triumph to the Texel, leaving the people of England smarting under their disgrace and loss. The peace of Breda was concluded two months afterwards, and it was left to other times to restore the tarnished flag of England to its proper lustre. James II., who, as duke of York, had been lord-high-admiral in the reign of his brother, and had retired in consequence of refusing to take the Test oath, was recalled to that post in 1684, just before his accession, and in the four short years which elapsed prior to his abdication, he had done much to put the navy into a better state; and indeed at the Revolution the fleet was in excellent condition.

Soon after the Dutch attack upon Sheerness, the fortifications were rendered much stronger than before, and mounted with a line of large and heavy cannon; and a garrison was placed in charge of them. The dockyard adjoins the fortifications. It is chiefly used for the repair of ships which have been slightly damaged, and for building frigates and smaller vessels.

The royal dockyards are at Deptford, Woolwich, Chatham, Sheerness, Portsmouth, Plymouth, and Pembroke. The one at Plymouth was formed in the reign of William III., and that at Pembroke early in the reign of George III. There is a small yard at Deal. The establishment at Deptford yard is at present on a very reduced scale. The victualling-yards for the navy are at Portsmouth, Plymouth, and Deptford. The dockyard at Portsmouth covers an area of one hundred acres; that at Plymouth about seventy-one acres; Sheerness yard about sixty acres; and the dockyard at Chatham is nearly a mile in length. All these are places of extraordinary activity during war, and many hundred men are employed in each yard, whose wages amount, for the whole of the dockyards, to the sum of nearly one million sterling per annum. When Commissioners were appointed, at the beginning of the present century, for inquiring into the civil affairs of the navy, it was found that this vast sum was "disbursed upon the faith of the signatures of the clerks of the cheque in the several yards, without the pay-books undergoing any check or examination whatever." This loose method has been long since corrected.

The attention of the same Commissioners was also directed to the defective education of shipwrights, many of whom, on being apprenticed, could neither read nor write; and it is observed that while serving their time, "no opportunity will be found of acquiring even the common education given to men of their rank in life, and they rise to the complete direction of the construction of the ships on which the safety of the empire depends without any care or provision having been taken on the part of the public that they should have any instruction in mathematics, mechanics, or in the science or theory of marine architecture." The Commissioners remarked that in France the theory of ship-building engaged the attention of men of science, but the theory and the practice were kept distinct; while in England, where such science as we possessed was combined with a perfect practical knowledge, our ships were better built, though not so well planned as those of France. We have, however, learnt to combine the science of marine architecture with the art of arranging the details. Under Sir Robert Seppings, the late surveyor of the navy, improvements were introduced calculated to effect an immense saving of timber and space, and the strength and durability of ships were also increased; and more recently the various naval architects have been permitted to try their respective systems in various experimental squadrons composed of vessels built under their directions. A great change has also gradually taken place in the size of ships of war. About the middle of the last century, the tonnage of first-rates was about 2000 tons, but we have at present one afloat and three building whose tonnage is above one-third greater—namely, 3100 tons; and we have now a frigate of greater tonnage than the first-rate ships of the reign of George II. This change must be taken into account in estimating the comparative naval strength of the country at different periods. In 1547 the tonnage of the royal navy was 12,000 tons; in 1603 the number of ships was 42, measuring 17,000 tons; on the death of Cromwell (1660) the navy consisted of 154 sail, measuring 57,643 tons; in 1685 there were 179 vessels, measuring 103,558 tons; in 1702 the number of vessels in the public service, including hulks, hoys, and others not carrying guns, was 272, measuring 159,000 tons. At the accession of George III., the royal navy was composed of 127 sail of the line and 198 fifty-gun ships and under, the whole number measuring 321,104 tons; in 1793, of 153 sail of the line and 411 other ships and vessels, whose tonnage was 402,555 tons; in 1803, of 189 sail of the line (many of which had been taken from the enemy) and 781 vessels of all other descriptions, the whole measuring 650,976 tons. In 1820 the number of men voted by parliament for the service of the navy was 23,003; in 1830, 29,000; and in 1838, 34,000. The navy was never in so high a state of efficiency as at the present moment.*

Our cut represents a first-rate line-of-battle ship lying off Sheerness pier. Mr. Canning, in a speech at Plymouth, in 1823, while deprecating a restless and meddling activity, and defending the peaceful policy of England from those who ascribed it to exhaustion, finely compared our latent strength and power to a dismantled ship of war. "Our present repose," he observed, "is no more a proof of inability to act, than the state of inertness and inactivity in which I have seen those mighty masses that float in the waters above your town is a proof they are devoid of strength and incapable of being fitted out for action. You well know how soon one of those stupendous masses, now reposing on their shadows in perfect stillness—how soon, upon any call of patriotism or of necessity, it would as-

* No. 442 of the 'Penny Magazine' contains an account of the present state of the navy, and an estimate of the naval strength of other maritime powers.

sume the likeness of an animated thing, instinct with life and motion—how soon it would ruffle, as it were, its swelling plumage—how quickly it would put forth all its beauty and its bravery, collect its scattered elements of strength, and awaken its dormant thunder. Such as is one of those magnificent machines when springing from inaction into a display of its might—such is England herself, while apparently passive and motionless, she silently concentrates the power to be put forth on an adequate occasion." Rightly he added, "But God forbid that occasion should arise."

BEETHOVEN.

LUDWIG VAN BEETHOVEN was born at Bonn, in the year 1770. His father was a tenor singer in the elector's chapel. At a very early age, Beethoven had made great progress in music, notwithstanding his being attacked by a disease which affected his hearing, and at last terminated in total deafness.

His first publications were treated with great severity by the German journalists; but it is always the fate of genius such as Beethoven's to be censured before it is understood. Those productions, so roughly treated by the critics of the time, probably contained crudities to which youthful inexperience is liable. Many of his early pieces, which are now looked on as smooth, clear, and correct compositions, were, within our remembrance, considered in England as wild, crabbed, and unintelligible. When Mozart's quartetts, those models of pure and delicate harmony, were originally published, a number of copies sent to Italy were returned to the publishers as being full of errors of the engraver. The severity therefore with which Beethoven's early compositions were treated by the German critics is by no means surprising. By the death of the Elector of Cologne, in 1801, Beethoven lost a zealous patron; and this event seems to have induced him to leave his native town and take up his abode in Vienna, in which city he resided for the rest of his life. Being of an independent spirit and utterly incapable of practising the arts of a courtier, he never succeeded in gaining the favour of the great, or in obtaining any of the advantages with which that favour is attended. He was appointed to no situation of emolument, and for the greater part of his life had nothing but the income derived from his compositions. He strongly felt a treatment which was unworthy of his genius, and frequently gave vent to his feelings with more freedom than prudence. At length, in 1809, he received an offer of the situation of *Maestro di Capella* to the newly formed court of Jerome Bonaparte, king of Westphalia, and was about to accept it when the Archduke Rudolph and the Princes Lobkowitz and Kinsky, ashamed of the neglect he had met with, and actuated by a liberality which did them honour, settled on him an annuity of four thousand florins (400*l.*) by a deed drawn up in flattering and delicate terms. The only condition was, that he should reside in Vienna or some other part of Austria Proper, and not travel into foreign countries without the consent of his patrons. He was thus placed in easy circumstances; but unfortunately, owing to the death of Count Kinsky and the ruin of Prince Lobkowitz, the greatest part of his pension was discontinued, and all that he was receiving at the time of his death was 720 florins, or 72*l.* per annum.

Meantime, while a rapid succession of great works was filling Europe with his fame, Beethoven was withdrawing himself more and more from intercourse with the world, and living in a state of seclusion, enjoying only the society of a few individuals, whose admiration of his genius, and personal regard, led them to accommodate themselves to the peculiarities of his disposition. The aristocracy of Vienna appear at length to have become aware of his claims to their respect. In 1824 an address was presented to him, with a number of noble and distinguished names attached to it, requesting him to be present at a performance of his own works. To this he agreed, and the concert took place on the 7th May, in the principal theatre in Vienna, which was crowded to excess, in consequence of which the performance was repeated. These were his last appearances in public.

In December, 1826, in consequence of travelling from the country to Vienna in very inclement weather, Beethoven caught a cold, which was followed by an inflammation of the lungs, symptoms of dropsy appeared, and he laboured under the disease until the 26th March, when he expired, after dreadful sufferings, which were aggravated by the dread of impending destitution, that made him deny himself the ordinary comforts of life. Such being not only his own impression, but that of his friends, with regard to his poverty, much surprise was excited when it was found that he died possessed of money to the amount of 1200*l.* sterling. Besides this sum, which he had saved, he enjoyed the remnant of the pension settled on him by the Archduke Rudolph, Prince Lobkowitz, and Count Kinsky. He had thus wherewithal to live according to his abstemious and retired habits; and when we consider his high and independent spirit, we can only ascribe the dread of want, which appears to have embittered his latter days, to the influence of disease in breaking down his once powerful mind.*

In stature he was short, and latterly extremely thin. "The neglect of his person which he exhibits," says Mr. Russell (*Tour in Germany*), "gives him a somewhat wild appearance; his features are strong and prominent; his face is full of rude energy. His hair, which neither comb nor scissors appear to have visited for years, overshadows his brow in a quantity and confusion to which only the snakes round a Gorgon's head afford a parallel. His general behaviour does not ill accord with the unpromising exterior; except when he is among his chosen friends, kindness and affability are not his characteristics. The total loss of hearing has deprived him of all the pleasure society can give, and perhaps soured his temper." "When seated at the piano, he is evidently unconscious there is anything in existence but himself and his instrument; and, considering how very deaf he is, it seems impossible he should hear all he plays. Accordingly, when playing very *piano*, he often does not bring out a single note. He hears it himself in 'the mind's ear.' While his eye and the almost imperceptible motion of his fingers show that he is following out the strain in all its dying gradations, the instrument is actually as dumb as the musician is deaf." "He seems," adds Mr. Russell, "to feel the bold, the commanding, and the impetuous, more than what is soothing or gentle. The muscles of his face swell, and its veins start out; the wild eye rolls doubly wild, the mouth quivers; and Beethoven looks like a wizard overpowered by the demons whom he himself has called up." He was extremely reserved in the company of strangers, and abrupt and blunt in his address. His passions were violent and wayward in the extreme, and so little under control, that some stories are told of his excesses of temper which are not a little startling, to English feelings at least. It is said that he had a servant whom he used, in the violence of his moods, to drag about by his hair. It is certain that he would publicly insult and even spit at people to whose countenances or personal appearance he may have taken any sudden and violent antipathy. If these things are to be extenuated, it can only be through such an opinion of the national manners as the countrymen of Beethoven would have little reason to thank us for. In his dress he is said to have been punctiliously particular; while others assert that in his ordinary walks he looked like a

* Hogarth's 'Musical History.'

beggar, and would stop people in the street to tell them of their faults. It must be added that he always showed the utmost anxiety to remove any mischief which his moody and overbearing temper might have occasioned among friends.

That Beethoven should have been regarded by the world as morose and misanthropic can scarcely be matter of surprise; yet he has appealed eloquently against such an opinion. In a will which he made during a dangerous illness he had many years before his death, is the following passage:—"Oh! ye inconsiderate men, who call me misanthrope. My mind was formed, from my very cradle, for the gentler feelings of our nature, while it seemed destined to accomplish something great; but only consider, in my sixth year I was unhappily attacked by a disease which was rendered still more afflicting by the blunders of the medicine-men in whose hands I was placed. After dragging on year after year, I was doomed to the unhappy prospect of an irremediable evil. Though born with an ardent and lively disposition, and a mind susceptible of the pleasures of society, I was obliged to withdraw early from a participation in them and lead a solitary life. When I would willingly have mixed among you, my misfortune was felt with double keenness, from the conviction it brought that I must forego the delights of social intercourse, the sweets of conversation, the mutual overflowings of the heart. When in the country, incited by my natural disposition, I was induced to join in the society of my neighbours, how bitter was my mortification when some one near me would stand listening to the tones of a flute which I could not hear; or to the shepherd's song sounding from the valley, not one note of which I could distinguish. Such occurrences had the effect of driving me almost to despair; nay, even raised in my mind gloomy thoughts of seeking relief in self-destruction. It was nothing but my art restrained me; it appeared impossible for me to quit the world till I had accomplished the objects I felt myself, as it were, destined to fulfil."

But making every possible allowance for his calamity, of which he thus touchingly complains, there is reason to believe that Beethoven was but little suited for social intercourse: some of his best friends are known to have said it was difficult to live with him on terms of intimacy. He was well read in the literature of his country, and also understood English well enough to read the poets and Scotch novels. Among his own countrymen, Goethe was his favourite, whose works, he used to say, exercised a deep influence over him, and had been the source of much of his inspiration. He appears to have liked the English, what little he saw of them, and would speak with anticipated pleasure of his intended visit to England (which, however, never took place), and enlarge with enthusiasm on the "noble simplicity of British manners." A singular anecdote is told of his death-bed. On his medical attendants informing him of his approaching end, he immediately cried out to those around him, "*Plaudite, amici! comedia finita è*" (clap your hands, my friends! the play is over).

Since the time of Haydn, no composer has created so wide a schism in the musical public of Europe as Beethoven. The question at issue can of course be decided by posterity alone. Doubts have been expressed, however, by many eminent professors, and among Beethoven's greatest admirers, as to whether some of his latter works will stand the test of time; nor are these doubts likely to be removed by the charge of "paltriness" with which he threatened all such as should express their inability to comprehend these productions. There is reason to fear that Beethoven suffered the moodiness of his temper to affect the productions of his muse, and was thus induced to fill his music with crude innovations out of a morbid opposition to existing opinion. He never could bear to hear his early works admired, yet it may be confidently said that many of these are among his finest and most lasting productions. Beethoven was a great scoffer at the rules of composition, and has recorded his opinion of them in terms of unmeasured contempt. Sometimes, when in good humour and conversing with his professional friends on his delinquencies in this respect, he would rub his hands with delight, saying, "Aye, aye, I should like to see what you gentlemen with your treatises on harmony would say to that." In this scorn of rules he has been followed by Rossini, who writes against the errors in his scores "*per saddisfazzione de' pedanti*" (for the edification of the pedants).

Of Beethoven's music it may be said briefly and generally, that in melody, the soul of music, as Mozart called it, he is inferior both to him and to Haydn. There are few, we suspect, who will not acknowledge that the melodies in each of these latter writers, which have become "familiar as household words" to us, far exceed in number, if not in quality, those furnished by Beethoven; but in the stern and massive grandeur of his harmonies he has certainly never been surpassed, perhaps never equalled, by any one but Handel.

If the scepticism we have alluded to respecting some of Beethoven's latter works should prove well founded, it may be fortunate for his reputation that he did not live any longer; but it has lately been asserted that the posthumous quartetts, upon which there exists so great a difference of opinion, are not genuine; that is, that they have been put together by some enterprising publisher from detached scraps of manuscript found among Beethoven's papers.

ROMAN COIN MOULDS.

The quantity of Roman money that has been found in various parts of the world at different times is very great, and the hoards that are still occasionally discovered prove that the stock is not yet exhausted. These coins have been so studied, and are so well known to numismatists, that a glance at one, though half defaced and mutilated, is frequently sufficient to give to a skilful connoisseur a knowledge of the æra, and even of the particular monarch whose image and superscription it bears. But the best antiquaries are occasionally puzzled by coins having reverses incompatible with their obverses, or, in common language, with heads and tails of different coinages; with the head of one emperor, and the tail belonging to the money of another. This difficulty is explained by the discovery of moulds for casting coin, which has been made more than once in different parts of the ancient Roman empire, and in a few cases so far away from the capital as the north of England. We shall proceed to give a succinct account of one of these discoveries, made about ten years ago in France, from which it seems evident, not only that considerable forgeries of coins were made in the later periods of the empire by unprincipled men, who then, as now, risked their lives for gain, but that the Roman emperors themselves were forgers, and that, while they punished the culprits as guilty of sacrilege, they themselves shared largely in the disgraceful traffic; that they issued perhaps a scanty coinage in genuine bullion, to save appearances, but that at the same time they carried on clandestinely a large manufacture of baser metal, more commonly in imitation of the money of their predecessors than of their own, and always of such emperors as had in some degree lowered the metallic standard, by which means their own departure from all standard would be less likely to be found out.

The manufactory we allude to was at Damery, near Epernay, a town about eighty miles east from Paris, and said to be the site of the ancient Bibe. While making some excavations in a park very near the old Roman road which passes by that place, the workmen came down upon an extensive building, which to all appearance had

been anciently a mint. There were heaps of cinders, charcoal, and broken tiles, and underneath these iron tongs, crucibles, shears, and hammers, suitable for making money, and what is still more significant, several moulds of baked clay for casting money, in some of which the coin was still remaining, with the lump formed by the superfluous metal running over, and several other indications, rendering it probable that the manufactory had caught fire when in full work; and that in consequence of the concealment necessary in such an illegal establishment, and of the wars which were desolating the country, all knowledge of the hidden treasure had been subsequently lost. This appears still more probable from the quantity of money found among the ruins, which, although of alloyed silver, was still of considerable value. Two large vases full of this money were found: in one there were more than two thousand pieces, above three-fourths of which bore the head of Posthumus, a Roman emperor, who reigned in Gaul, one of those numerous chiefs who held a precarious sovereignty in various parts of the Roman empire about the middle of the third century, now known by the fanciful name of the thirty tyrants. The earliest of the series in this vase were of emperors who reigned fifty years before, and the others were of intermediate reigns. They were all of bad fabric, and of the same debased metal; but although the devices upon them appeared to indicate such difference of age, they were all made precisely of the same alloy, were all equally new, and in fact had never been in circulation. Another vase contained above four thousand coins, all of brass, and principally of the emperors Constans and Constantius, and with the mint marks upon them of Rome, Constantinople, Lyons, Treves, and other places, although there can be little doubt that they were all made in this newly discovered manufactory. There were no coins later than those of Constans and Constantius, which leads us to conclude that the mint was in operation under them, an epoch when the Franks were making their dreaded incursions into Belgic Gaul, where Bibe was situated.

The most satisfactory evidence that these coins were all cast at this place and at the same time, was the finding above three hundred moulds for casting a number of coins all together, bearing the heads of different emperors and names of different places. All these moulds were made of hardened clay, and the manner of making them was obvious from their appearance. A number of pieces of softened and well-worked clay must have been prepared, each rather larger than the coins intended to be cast: one of these pieces of clay was then laid flat upon a table, and a coin laid upon it, and pressed in so as to make an impression upon its upper surface. On the coin another piece of clay was laid, and pressed down, so as to receive an impression upon its under surface; another model coin was then pressed down upon this second piece of clay, and thus another impression was made upon its upper surface. The process was continued until a series was formed, usually of twelve coins, or thirteen pieces of clay, the top and bottom of which had only one impression each, but all the other pieces had impressions on both sides, obviously of two different coins. This will explain the coins with what are called blundered reverses, alluded to at the beginning of this article. They were evidently occasioned by making up the pile of clay moulds hastily, and inadvertently misplacing the pieces, so that the reverse of one coin when cast was found opposite to the head of one which belonged to a different emperor.

When three piles of moulds were completed in this manner, they were placed in contact, side by side, so that each pile touched two others. Any one may have a good idea how this was done by heaping up three piles of halfpence, and putting them together upon a table; he will see that when they are in contact a triangular hollow is formed between them, down which melted metal might be poured. But before putting the clay piles in contact, the model coins were taken out, and little holes made on the side of each pile, to admit the metal to run into the moulds; and in placing the piles, care was taken that all the holes should be turned inwards, so as to be withinside the longitudinal hollow left in the centre. Upon the top of all was placed a clay cup perforated through the bottom, to receive the melted metal and convey it to the moulds, and the whole was then made perfectly dry. The state in which some of the moulds were found proved the suddenness of the cause which put a final period to the work; the new coin was within them, and even the lump of metal which ran over when the casting was effected still remained. One of these lumps, from which a drawing was made at the time, came from a pile in which thirty-six pieces had been cast. The piece, which was of the bigness of a man's little finger, had three rows of points sticking out from its sides, corresponding with the holes by which the metal had entered the moulds; and at the top a large knob of metal was left which had filled the cup where it was first run in. These moulds were probably used for more than one casting; they were without doubt taken to pieces very carefully, to avoid breakage in removing the coin, and put together again as carefully; and although some little damage might have been sustained in the process, the appearance of the coin in those times was generally so bad, that a little additional imperfection would readily pass without notice. Some of the moulds thus found have actually been tried again, and even after the lapse of fifteen centuries very passable coins have been procured from them.

The great extent of the manufactory at Damery, and its situation near a great military road, prove that it was not an establishment of obscure coiners; it was certainly maintained at least with the connivance of the government, but most probably it was really a government establishment, though perhaps carried on somewhat clandestinely; and this will account for the very great number of coins of debased silver and imperfect fabric found with the heads of the Cæsars of the third and fourth centuries of the Christian æra. But with the moulds discovered in England, a province more remote from the seat of government, the case was different. We allude to some which have been turned up by the plough at different times near Lingwell, between Leeds and Wakefield in Yorkshire. These were pretty clearly the work of forgers; they were found at a considerable distance from any great road, in the heart of a forest, and the money, which has in a few cases been found in them, is not of a silver alloy, but of copper, intended, without doubt, to be plated over, as it was the counterfeit of a denarius, a silver coin. An earthen crucible for melting the metal was also found at Lingwell, and it may be remarked that the piles were put together, not in threes, but in twos, a mode less convenient, and certainly requiring additional trouble, but perhaps more suitable to the smaller scale on which the work was carried on.

It may be concluded that the prevalence of this forged money was a cause of the decline of the Roman coinage as works of art in the lower empire, more efficient than the decline of art itself. The imperial forgers felt that it was not their interest to produce a handsome coin which would be difficult to imitate, when they themselves drew a profit from its imitation, and which would call attention to the base and imperfect money their avarice impelled them to issue.

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ON THE REPUTED EARLIEST PRINTED ENGLISH NEWSPAPER.

[Head of a Newspaper of the Seventeenth Century.]

In Chalmers's 'Life of Ruddiman,' the Scottish grammarian, who was for some time editor of the 'Caledonian Mercury,' there is a dissertation on the origin of newspapers, which contains the following passage:—"After inquiring, in various countries, for the origin of newspapers, I had the satisfaction to find what I sought for in England. It may gratify our national pride to be told that mankind are indebted to the wisdom of Elizabeth and the prudence of Burleigh for the first newspaper. The epoch of the Spanish Armada is also the epoch of a genuine news-paper. In the British Museum there are several news-papers which had been printed while the Spanish fleet was in the English Channel, during the year 1588. It was a wise policy to prevent, during a moment of general anxiety, the danger of false reports, by publishing real information; and the earliest news-paper is entitled 'The English Mercurie,' which, by *authority*, 'was imprinted at London by Christopher Barker, her Hignesses printer, 1588.'" This statement of Chalmers's was put forth in 1794, nearly half a century ago, and it seems to have gratified our national vanity so much as never to have been once questioned. It has been repeated by erudite inquirers into the history of English literature, and copied over and over again in cyclopædias, magazines, books of all kinds for desultory reading, and is often given as a reading lesson in class-books for schools. Ask any schoolboy, "To whom are we indebted for the first English newspaper?" and he will reply, "To the wisdom of Elizabeth and the prudence of Burleigh."

It is somewhat provoking, after this account of the origin of newspapers has been an article of the national belief for so long a period, to discover that not only is it of doubtful and suspicious authority, but that the whole story is an imposition, and has only been successful because, though the proofs of the forgery were daily open to hundreds of persons, the spirit of critical inquiry was never directed to a question which had been apparently placed on the firmest foundations by Chalmers and succeeding writers of greater authority who had in a great measure depended upon his statements. But the gravest and most deeply-cherished errors are always in danger, either from the sudden giving way of the foundations on which they rest, or from the more certain process of sapping and mining. "On the 4th instant," says Mr. Watts,* of the British Museum, "I was induced to refer to the 'English Mercurie,' by a consideration respecting it suggested in the article 'Armada' in the 'Penny Cyclopædia;'" and Mr. Watts then observes,—"On the book being brought, I had not examined it two

* 'A Letter to Antonio Panizzi, Esq., keeper of the printed books in the British Museum, on the Reputed Earliest Printed Newspaper, "The English Mercurie, 1588," by Thomas Watts, of the British Museum.' This letter is dated Nov. 16th, 1839. Considerable doubts were entertained respecting the genuineness of the 'English Mercurie' before the date which Mr. Watts assigns for the origin of his first suspicions on this point. In part lxxxii. of the 'Penny Cyclopædia,' published at the end of November, this doubt is distinctly expressed by the writer of the article 'Newspapers,' whose manuscript was in the editor's hands before the 4th November. After stating that copies of the 'English Mercurie' are in the British Museum, the writer observes:—"It must not however be concealed that doubt is entertained of the genuineness of these papers. Two of them are not of the time, but printed in modern type; and no originals are known: the third is in manuscript of the eighteenth century, altered and interpolated with changes in old language, such only as an author would make."

minutes, before, to my surprise, I was forced to conclude that the whole was a forgery." This suspicion was confirmed by the examination of other literary antiquarians; and as Mr. Watts remarks, "the unaccountably successful imposition of fifty years was shattered to fragments in five minutes."

We are bound, however, to lay before the reader the proofs on which it is asserted that "the claims of the English to the invention of printed newspapers are unfortunately of no validity, and that the 'earliest newspaper' in the Museum is an imposture."

We shall pass over several of the minor circumstances which Mr. Watts regards as conclusive, but are too weak in themselves to sustain the proof of forgery. The evidence must rest principally on the following points:— 1. The type employed is not that of the period, but that of a century ago. "The distinction between the u's, v's, and the i's and j's, utterly unknown to the printers of the sixteenth century, is here maintained throughout in all its rigour." 2. Though the orthography of the sixteenth century was capricious, yet it had certain peculiarities sufficiently marked to separate it from that of the eighteenth century. Mr. Watts has compared the 'English Mercurie' with a work entitled 'A Pack of Spanish Lyes,' printed by the deputies of Christopher Barker, in 1588; and if the 'Mercurie' had issued from the same printing-office, in the same year as the book in question, there would at least have been many points of orthographical uniformity; but in this respect the two works are "almost always at variance." The name of the lord-admiral's ship, which, in the 'Pack of Spanish Lyes' is spelt the 'Arke Royall,' is spelt in the 'Mercurie' the 'Ark Royal.' 3. The style of composition is not of the date to which it pretends. Words, phrases, and modes of expression are made use of which were either unknown at the time or were employed in a sense which did not become familiar to English ears until a period much later than the date of the 'Mercurie.' Thus the word 'regiments' is used; while Hakluyt, ten years afterwards, when writing of the Spanish Armada, is compelled to give an explanation of the word. "There were in the said naue five *terzaes* of Spaniards (which *terzaes* the Frenchmen call regiments)." Other instances of a similar kind might be given. 4. Mr. Watts is of opinion that an article of news in the 'Mercurie' of July 23rd, 1588, purporting to give an account, written by the lord-admiral, of events of which we now possess a most minute relation, could only be the work of a newspaper manufacturer copying from a confused statement of the same events by Camden. 5. The three printed copies of the 'Mercurie' preserved in the British Museum are numbered 50, 51, and 54; and the manuscript copy of two others, intended to have been Nos. 52 and 53. Nos. 50, 51, 52, and 53 are all dated July, 1588; and No. 54 commences with the date Monday, November 24th in the same year, the three (or nearly four) intervening months being a period of most exciting interest, and marked by the extremes of national alarm and national exultation at the appearance and defeat of the Armada. "Is it possible to believe," asks Mr. Watts, "that, under these circumstances, a statesman who had already issued fifty-three numbers of a newspaper, four of them in the course of eight days, would allow August, September, October, and almost the whole of November, to pass by without publishing a fifty-fourth?" 6. As to the manuscript copies of the 'Mercurie' which are bound up with the printed copies, Mr. Watts shows that they contain "the most convincing, the most irrefragable evidence that the whole affair is a fraud." The hand-writing of the manuscript is as modern as the type of the printed copies, and the spelling is modern spelling; while in the printed copies the printer has endeavoured to give the spelling "the proper antique flavour," and has not succeeded very well. These manuscript copies are not a transcript from some earlier printed copy not found or known to exist. "The alterations in the manuscripts are not those of a transcriber, but of an author." Mr. Watts prints a long verbatim extract from the manuscript to show that the alterations are "so very numerous, that a transcriber who could perpetrate such a series of blunders must be a moral phenomenon;" and he remarks, lastly, that "the corrections are, in many cases, themselves corrected; sometimes by a return to the original statement or mode of expression, a circumstance likely to occur often in the alterations of an author, but never in the corrections of a copyist." Moreover the paper bears the water-mark of the royal arms, with the initials 'G. R.' Nor is the difficulty overcome by assuming that not only is the manuscript a transcript from the copy as originally written, but the printed copy is also a reprint, as it would be impossible that so remarkable a work as the 'Mercurie' should have been in existence after the middle of last century, when it had attracted some curious antiquarian, who caused not only written but printed copies to be made of it, and that it should now be lost and nothing known of its history.

It appears, from the letter of Mr. Watts, that the 'English Mercurie' came into the British Museum in 1766, on the death of Dr. Birch, to whose collection they belonged. There were three accomplished literary forgers of the period, Chatterton, George Steevens, and William Rufus Chetwood. In 1766 Chatterton was only fourteen years of age, and was at a charity-school in Bristol. The manuscripts are neither in the hand-writing of Steevens nor Chetwood; but either of these characters, after having devised the forgery, might have left its execution to an accomplice. The question "Who was the forger?" is an interesting one, and will doubtless excite the attention of the curious in questions of literary history. Mr. Watts's opinion of the printed and manuscript copies is that "the printed copies were got up for the purpose of imposition, that the attempt was detected, and that the whole of the papers were preserved as a memorial of the occurrence." Still it is singular, if Dr. Birch were aware of this unprincipled attempt, that he should neither have made it public in his lifetime, nor left any record behind him concerning it.

The invention of printed newspapers, as it cannot be claimed by England, is now a matter of interesting dispute and inquiry. It does not belong to France; for in the 'Paris Gazette,' begun in the year 1631, it is remarked in the dedication to the king at the beginning of the first volume, that the publication of gazettes "is indeed a novelty, but in France only." It will probably be found that the honour belongs either to Venice or Nuremberg.

In England we had without doubt genuine newspapers very early in the seventeenth century, that is, some twenty years only after the date of the fictitious 'Mercurie;' but, as it is remarked in the 'Pictorial History of England,' the *æra* of English newspapers commences with the first year of the Long Parliament (1640). More than a hundred newspapers, with different titles, appear to have been published between this date and the death of the king (1649), and upwards of eighty others between that event and the Restoration (1660). Chalmers, in his 'Life of Ruddiman,' informs us that "when hostilities commenced, every event during a most eventful period had its own historian, who communicated 'News from Hull,' 'Truths from York,' 'Warranted Tidings from Ireland,' and 'Special Passages from several places.' These were all occasional papers. Impatient, however, as a distracted people were for information, the news were never distributed daily. The various newspapers were published weekly at first; but in the progress of events and the ardour of curiosity, thy were distributed twice or thrice in every week. Such were the 'French Intelligencer,' the 'Dutch Spy,' the 'Irish Mercury,' and

the ' Scots Dove,' the ' Parliament Kite,' and the ' Secret Owl.' "

At the conclusion of his letter Mr. Watts directs attention to an error which has obtained almost as extensive a currency as that concerning the origin of newspapers. " The Gentleman's Magazine,' " he observes, " unaccountably passes for the first periodical of that description, while, in fact, it was preceded nearly forty years by the ' Gentleman's Journal ' of Motteux, a work much more closely resembling our modern magazines, and from which Sylvanus Urban borrowed part of his title and part of his motto; and while on the first page of the first numbers of the ' Gentleman's Magazine ' itself, it is stated that it contains ' more than any book of the *kind* and price.' "

ANECDOTES OF AMERICAN HORSES.

[From a Correspondent.]

There are various instances on record fully establishing the courage and sagacity of that noble animal the horse. The following incidents I am about to relate occurred in America, to horses bred in that country.

A short distance below Fort Erie, and about a mile from where the river Niagara escapes over a barrier of rock from the depths of Lake Erie, a ferry has long been established across that broad and *there* exceedingly rapid river, the distance from shore to shore being a little over one-third of a mile. On the Canada side of the river is the small village of Waterloo, and opposite thereto on the United States side is the large village of Blackrock—distant from the young and flourishing city of Buffalo two miles. In completing the Erie Canal, a pier or dam was erected—up and down the river, and opposite to Blackrock, at no great distance from the shore, for the purpose of raising the waters of the Niagara to such a height that they might be made to supply an adjoining section of the Erie canal. This pier was (and is) a great obstruction to the ferry-boats; for previous to its erection passengers embarked from *terra firma* on one side of the river, and were landed without any difficulty on the other; but after this dam was constructed it became necessary to employ two sets of boats—one to navigate the river, and the other the basin; so that all passengers, as well as goods or luggage, had to be landed upon this narrow wall or pier, and re-shipped.

Shortly after the erection of the pier dam, a boat propelled by horses was established between this pier and the Canada shore. The horses moved upon a circular platform, which consequently was put in motion, to which other machinery was connected, that acted upon paddle-wheels attached to the sides of the boat. The boat belonged to persons connected with the ferry on the American side of the river; but, owing to the barrier formed by the pier, the horses employed on the boat were stabled at night in the village of Waterloo. I well recollect the first day this boat began to ply,—for the introduction of a boat of that description, in those days, and in such a situation, was considered an event of some magnitude. The two horses (for *that* boat had but two) worked admirably, considering the very few lessons they had had (upon the tread-mill, as it was called) previous to their introduction upon the main river.

One of the horses employed on the new ferry-boat had once been a dapple-grey, but at the period I am speaking of he had become white. He was still hale and hearty, for he had a kind and indulgent master. The first evening after the horses had been a short time in the stable, to which they were strangers, they were brought out for the purpose of being watered at the river, the common custom at this place. The attendant was mounted upon the bay horse,—the white one was known to be so gentle and docile, that he was allowed to drink where he pleased. I happened to be standing close by, in company with my friend W———n, the ferry contractor on the Canada side, and thus had an opportunity of witnessing the whole proceedings of old Grizzle, the name that the white horse still went by. The moment he got round the corner of the building, so as to have a view of his home on the opposite side,—he stopped—and gazed intently. He then advanced to the brink of the river,—when he again stopped and looked earnestly across for a short time;—then waded into the water until it had reached his chest—drank a little, lifted his head; and, with his lips closed, and his eyes fixed upon some object upon the farther shore, remained for a short time perfectly motionless. Apparently having made up his mind to the task, he then waded farther into the river until the water reached his ribs,—when off he shot into deep water without a moment's more hesitation.

The current being so strong and rapid, the river boiling and turmoiling over a rocky bed at the rate of six miles the hour, it was impossible for the courageous and attached animal to keep a direct course across, although he breasted the waves heroically, and swam with remarkable vigour. Had he been able to steer his way directly across, the pier-wall would have proved an insurmountable barrier. As it was, the strength of the current forced him down to below where the lower extremity of this long pier abuts upon an island, the shore of which being low and shelving, he was enabled to effect a landing with comparative ease. Having regained *terra firma*, he shook the water from his dripping flanks, but he did not halt over a few minutes, when he plunged into the basin and soon regained his native shore.

The distance from where Grizzle took the water to where he effected a landing on the island was about seven hundred yards; but the efforts made to swim directly across, against the powerful current, must have rendered the undertaking a much more laborious one. At the commencement of his voyage his arched neck and withers were above the surface, but before he reached the island nothing but his head was visible to us.

He reached his own stable-door, that home for which he had risked so much, to the no small astonishment of his owner. This unexpected visit evidently made a favourable impression upon his master, for he was heard to vow, that if old Grizzle performed the same feat a second time, for the future he should remain on his own side of the river, and never be sent to the mill again. Grizzle was sent back to work the boat on the following day, but he embraced the very first opportunity that occurred of escaping, swam back in the way he had done before, and his owner, not being a person to break the promise he had once made, never afterwards dispossessed him of the stall he had long been accustomed to, but treated him with marked kindness and attention.

During my residence on the head-waters of the Susquehana, I owned a small American horse, of the name of Charlie, that was very remarkable for his attachment to my own person, as well as for his general good qualities. He was a great favourite with all the family; and being a favourite, he was frequently indulged with less work and more to eat than any of the other horses on the farm. At a short distance from the dwelling-house was a small but luxuriant pasture, where, during the summer, Charlie was often permitted to graze. When this pasture had been originally reclaimed from its wild forest state, about ten years previous to the period of which I am speaking, four or five large trees of the sugar-maple species had been left standing when the rest were cut down, and means had afterwards been found to prevent their being scorched by the fire at the time the rest of the timber had been consumed. Though remarkably fine trees of their kind, they were, however, no great ornament, their stems being long and bare, their heads small and by no means full of leaves,—the case generally with trees

that have grown up in close contact with each other in the American forests. But if they were no ornament, they might serve as shade-trees. Beneath one of these trees Charlie used to seek shelter, as well from the heat of the meridian sun, as from the severe thunder-gusts that occasionally ravage that part of the country. On an occasion of this sort Charlie had taken his stand close to his favourite tree, his tail actually pressing against it, his head and body in an exact line with the course of the wind; apparently understanding the most advantageous position to escape the violence of the storm, and quite at home, as it were, for he had stood in the same place some scores of times. The storm came on, and raged with such violence that the tree under which the horse had sought shelter was literally torn up by the roots. I happened to be standing at a window from whence I witnessed the whole scene. The moment Charlie heard the roots giving way behind him, that is, on the contrary side of the tree from where he stood, and probably feeling the uprooted tree pressing against his tail, he sprang forward, and barely cleared the ground upon which, at the next moment, the top of the huge forest-tree fell with such a force that the crash was tremendous, for every limb and branch were actually riven asunder. I have many a time seen horses alarmed, nay, exceedingly frightened; but never in my life did I witness any thing of the sort that bore the slightest comparison to Charlie's extreme terror; and yet Charlie, on ordinary occasions, was by no means a coward. He galloped, he reared his mane, and tossed his head, he stopped short, and snorted wildly, and then darted off at the top of his speed in a contrary direction, and then as suddenly stopped and set off in another, until long after the storm had considerably abated, and it was not until after the lapse of some hours that he ventured to reconnoitre—but that at a considerable distance—the scene of his narrow escape.

For that day at least his appetite had been completely spoiled, for he never offered to stoop his head to the ground while daylight continued. The next day his apprehension seemed somewhat abated, but his curiosity had been excited to such a pitch that he kept pacing from place to place, never failing to halt as he passed within a moderate distance of the prostrate tree, gazing thereat in utter bewilderment, as if wholly unable to comprehend the scene he had witnessed the preceding day.

After this occurrence took place I kept this favourite horse several years, and during the summer months he usually enjoyed the benefit of his old pasture. But it was quite clear that he never forgot, on any occasion, the narrow escape he had had; for neither the burning rays of the noontide summer sun, nor the furious raging of the thunder-storm, could compel Charlie to seek shelter under one of the trees that still remained standing in his small pasture.

HISTORY OF A COTTON GOWN.—No. II.

[The little wheel, commonly called the Leipzic or Saxony wheel.]

It frequently happens that the principle which pervades an important process, or which is the distinguishing feature in a complex machine, may be better understood by a consideration of the primitive or rude modes of proceeding than by describing at once those of modern date. We think that this remark is applicable on the present occasion. We have brought the materials for our cotton gown to that state where the labours of the

spinner are required. Now in order to form some idea how the *spinning-jennies*, *throstle-frames*, and *mules* perform this operation, we will briefly consider the *domestic* mode of spinning, now almost unknown in this country on account of the cheapness of machine-spun yarn.

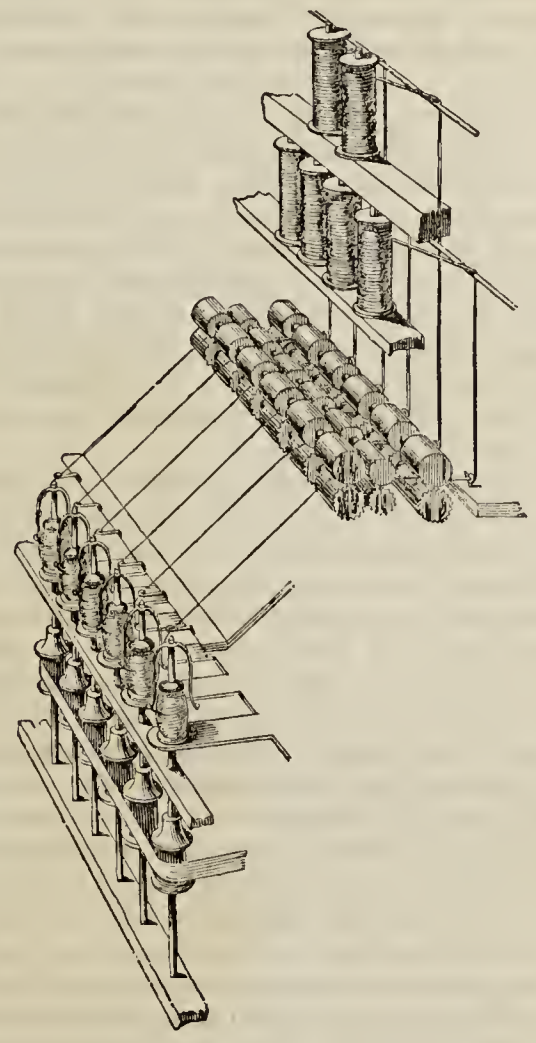
The object of spinning is to draw out the *rovings* of cotton (which are soft and easy to be broken), and *twist* them round their centre until all the fibres are so curled as to form a tolerably firm thread—not such as is used for sewing, but such as is employed by the weaver under the name of *yarn*. This used to be effected by means of a wheel similar to that represented in the cut given in the 'Penny Magazine,' No. 274, commonly called the big wheel. The spinster is seated on a stool, and takes one of the bobbins in her lap. Unfastening one end of the roving, she attaches it to the end of a horizontal spindle, which is so connected to a large wheel as to be set in rotation by it. The spinster, holding the cotton in the left hand, draws her hand back to some distance from the spindle; and then, by turning the wheel with her right hand, *twists* the portion of cotton extending from the spindle to her left hand. When this is twisted into a tolerably firm yarn or thread, she winds it on the spindle by reversing the motion of the wheel. The main principle in this operation is this, that by stretching out a portion of the cotton, and causing the spindle, to which one end of it is attached, to revolve, the cotton invariably receives a *twist*, which condenses and hardens the assemblage of fibres. The little wheel, of which we have given a representation above, occupied the fore-finger and thumb of both hands, those of one hand holding the filaments, while the other drew them out into an equable thread. Sometimes two spindles were attached, and the spinster could then form a thread with each hand. The twisting and winding of the thread were also carried on together by means of an ingenious piece of mechanism. This wheel, however, was chiefly used for flax.

In a way very similar to this was conducted the spinning of almost all the cotton employed in this country until about 1760. It used to be done by the wives and daughters of cottagers by their own fire-sides. The cotton-weavers of that day were accustomed to work at their own houses; and as each weaver could weave as much yarn as three women could spin with their wheels, he was obliged, after having worked up that which his wife and daughters had spun, to apply to the spinsters of the neighbourhood for a further supply. When the demand for cotton goods increased, the supply of spun-yarn was so inadequate, that a weaver was frequently under the necessity of trudging three or four miles in a morning, and visiting many spinners, before he could collect yarn enough to keep his loom at work during the rest of the day; and such was the competition he met with from other weavers similarly employed, that he was often obliged to treat the females with presents in order to quicken them at their work.

This was a critical period in the history of our cotton manufacture; for had not some machine been invented to accelerate the production of spun-yarn, the supply would have been obtained from other countries instead of our own. This was prevented by the labours of James Hargreaves, who invented the *spinning-jenny*. This was a machine formed on the basis of the spinning-wheel, but differing from it in these important particulars, that the wheel which the spinner turned with his right hand set in rotation several dozen spindles instead of a single one; and a frame which he held in his left hand guided and managed several dozen threads instead of one single thread; in fact, the machine was equivalent to multiplying the number of hands, both right and left, possessed by the spinner. Hargreaves met with a return that too often falls to the lot of those who benefit mankind: his house was broken open and his machine destroyed by the envious spinners of the neighbourhood.*

The invention once made, however, was not lost to society. A variety of improvements, chiefly by Arkwright and Crompton, were brought to bear in the spinning apparatus. These improvements are all susceptible of being separated into two classes, one in which there is a moveable frame of some kind to stretch out the threads before they receive their twist, and another in which that motion is dispensed with. A cottage spinster, who moves her left hand alternately to and from her spindle, works on the first-named plan: the spinning-jenny of Hargreaves acted on the same plan by the movement of a frame to which the threads were attached: lastly, Crompton invented the *mule-jenny*, in which the threads were stretched by the movement of a little four-wheeled carriage instead of the hand-frame of the spinning-jenny.

On the other hand, a different kind of spinning action was produced by Arkwright's *water-twist frame*, and by a more recent form of machine called the *throstle*. The most essential parts of these machines may be seen from the annexed cut. In the upper part are several



[Throstle-Spinning Apparatus.]

bobbins, containing cotton roving, as brought from the roving-machine. By the rotation of these bobbins the roving is unwound; and after passing over a slender bar, is carried between some pairs of horizontal rollers, which, by a varying velocity, have the effect of drawing or stretching the cotton. The roving from each bobbin then passes down one prong of a curious kind of fork, called a *flier*, and as this flier rotates round a little pirn or bobbin, the cotton, which becomes firmly twisted by the rotation of the flier, is wound on the bobbin in the form of *yarn*. The bobbins are made to rotate by a band passing round the spindles beneath them.

There are many elaborate pieces of mechanism connected with the spinning apparatus, but it would be im-

* See a wood-cut of this machine, in No. 274.

possible to mention them here. Indeed the reason why we have described the difference between *mule-spinning* (that in which a frame travels to and fro) and *throstle-spinning* (that in which a fork-like flier revolves round the spindle) is, because the yarn produced is of different quality in the two cases. Arkwright's machines were of the latter description, and were fitted to spin *warp*, or long threads, and hosiery yarn, of a stout quality; while Hargreave's *jenny* was fitted to produce a soft yarn for *weft*, and for many years all our cottons were made according to those respective qualities. The improvements in both classes of machines have not changed their *relative* character, for Dr. Ure says—"The *mule* makes a definite length of yarn, after which it winds it up while the operation of spinning is suspended; whereas the throstle makes the yarn and winds it up simultaneously. The *mule* is used generally for all numbers above 30's (a technical name for a certain thickness of yarn), *throstles* being now seldom used to spin so high as 40's. The quality of the yarn produced by the two machines is quite different. The throstle yarn, known under the name of *water-twist* (from having been first produced by the machine called a *water-frame*) is smooth and wiry; while the mule-yarn is of a soft and downy nature. The former is usually employed for *warps* in heavy goods, such as fustians, cords, or for making sewing-thread; and the latter for *weft* in coarse goods; as also for both warp and weft in finer fabrics."*

The reader may perhaps be surprised that the material for our cotton gown is not further advanced—that it is yet only thread, mere thread. But the truth is, that the processes which precede *weaving* are of infinitely greater importance than weaving itself. The production of good yarn was deemed by our Arkwrights, Hargreaves, and Cromptons, as more deserving of their study than the weaving of that yarn into cloth. Weaving is, however, of great importance, and is only *comparatively* shrouded by the vast efforts made to improve the processes of carding, drawing, spinning, &c.

The yarn which has been prepared in the modes described is devoted to different purposes; some is made into bobbin-net thread, some into lace-thread, some into stocking-thread, and another portion into sewing-cotton or thread, which is sold in balls, reels, and skeins. For the preparation of these various kinds of thread, two, three, or four yarns are laid parallel and twisted together into a firm and compact thread by machines constructed for the purpose. But the larger portion is used by the weaver in the state of yarn, and is by him converted into calico and all the numerous kinds of cotton fabrics. The difference between these fabrics arises principally from the different thickness and quality of the yarn employed, and from the different modes of making the threads interlace among one another.

When cotton has been spun into yarn, and is destined for the market, it is made up into hanks of 840 yards each. But when it is woven in the same manufactory where it has been spun, the yarn is wound off from the small bobbins upon larger ones. Several of these bobbins are then taken to a machine called the *warping-mill*, where, by a beautiful train of operations, from two to four thousand threads are ranged and stretched side by side: these form the *warp* of the intended piece of cloth, and the number of threads varies with the width which the cloth is intended to be. Most cottons in the next operation receive a coating of glue, size, paste, or starch. The object to be attained by this seems to be sometimes to facilitate the weaving, sometimes to impart a certain degree of strength to the cotton, and at others the less creditable one of making them appear more stout and compact than they really are. Formerly the sizing, or *dressing*, was done by hand; but it is now effected in an ingenious machine, in which the yarn dips into a trough of paste or size—passes between two rollers to have a portion of that covering squeezed from it—then over a hollow chamber heated by steam, by which the paste is dried,—and is finally wound on a large roller called a warp-beam: all these effects are produced while the yarn is travelling from one end to the other of the machine. The warp-beam, with the yarn upon it, is then conveyed to the weaving-loom.

The yarn just alluded to is to form the *warp*, or longitudinal thread, of the cloth. The yarn for the weft is fastened up into hanks, and from thence transferred by the weaver to his shuttle. We may here remark, in connection with these hanks, that the *number* attached to any particular quality of yarn represents the number of hanks to the pound, the hank always containing 840 yards. Thus we have No. 40, 60, 80, &c. The last-named quality was deemed a wonder when Crompton's spinning-apparatus first produced it, and he obtained two guineas per pound for it; but such have been the improvements since his day, that even a finer quality, No. 100, can be procured for three shillings per pound; while the power of producing exquisitely fine yarn has advanced to such a degree, that as high a number as 350 has been produced, that is, 350 hanks of 840 yards each, or 294,000 yards, to the pound.

Weaving will be briefly described in the next paper; but we may here remark that it was the impetus given to the cotton manufacture by the improvements in spinning that led to the substitution of power or machine weaving for hand-weaving. The foot and the hand of the weaver were found to move too slowly for the demand of the market. It was said by Dr. Cartwright:—"Happening to be at Matlock in the summer of 1784, I fell in company with some gentlemen of Manchester, when the conversation turned on Arkwright's spinning-machinery. One of the company observed, that as soon as Arkwright's patent expired, so many mills would be erected, and so much cotton spun, that hands never could be found to weave it: to this observation I replied, that Arkwright must then set his wits to work to invent a weaving-mill." This conversation was the exciting cause of the production of a loom for which Dr. Cartwright received 10,000*l.* from parliament, and which was followed by repeated improvements: the result of this has been, that a weaver can produce twenty pieces of cloth in the time formerly necessary to produce two.

* 'Cotton Manufacture of Great Britain,' vol. ii., p. 119.

SNOW-STORMS IN MOUNTAIN DISTRICTS.

[From a Correspondent.]

Those who have never witnessed the great accumulation of snow which takes place during some severe winters in the mountainous district of the north of England, as well as of Scotland, would scarcely credit the extent, the length, the breadth, and the depth of some of the immense masses of snow that accumulate in certain situations among the mountains; and many persons there are, no doubt, who are totally ignorant of the fact, that in every mountain district of the north there are snow-drifts that *never* wholly dissolve and disappear, but fragments of which remain from season to season, and from year to year, in the hollows and declivities of the mountains (for the most part where the aspect is northerly), notwithstanding the copious and frequent falls of spring and autumn rain, to which these mountain districts are peculiarly liable, and the dissolving influence of the gentle breezes of summer. These fragments of the winter snow-drifts are seldom visible from the roads and highways leading through the open and more distant part of the country, or even along the adjacent valleys, and consequently their existence is known only to those who are familiar with the situations they are known to occupy. In these upland districts but small quantities of grain are grown, the soil for the most part being unsuited to corn crops, while the climate is even more so. Hence

the farmers turn their attention to the breeding of sheep and black cattle, the mountain districts of the north of England being mostly sheep-farms; while in various parts of the hilly country in Scotland large numbers of black cattle are bred and sent to the southern markets.

In the sheep districts in the north of England the farms are seldom large, and yet many of the farmers manage to keep pretty numerous flocks of sheep, varying from three or four hundred to the same number of thousands. This, however, is effected only where population is scanty, and where the commons (usually called fells) are very extensive, and upon which the owners or occupiers of the enclosed land or farms enjoy an unlimited right of pasturage, or common right, as it is generally called. Hence it frequently happens that the occupier of 80 or 100 acres of enclosed land, and much of it of but an indifferent quality, if he possess sufficient capital, and the farm be conveniently situated, will keep a flock of sheep of 1000 or 2000 of the small black-faced or mountain breed, the whole of which he summer-pastures on the fells or moors; but a considerable portion of which, particularly the younger and weaker part, he has to send out, at so much per head, into some more congenial part of the country, during the winter season. He could not, however, afford to pay for winter pasturage for the whole of his flock, and therefore the greater portion remains in his own enclosures, or on the lower ranges of mountain-land contiguous thereto, during the winter, endeavouring to procure a scanty subsistence among the heath, the rushes, and the bent grass, in the best way they are able. But when the snow lies deep, and the weather is very severe, these animals, hardy as they undoubtedly are, would absolutely starve were they not supplied with a little hay from the homestead. The hay is commonly borne on the heads or backs of the shepherds, in bundles as large as they can possibly wade through the snow with; but occasionally on the backs of horses, where they can travel without much danger or difficulty. The hay is secured into a species of rude net-work formed of withies, and known by the local appellation of creels, in which loose hay, as well as that which is more solid, may be packed firmly and securely. When a snow-storm is of long continuance, the shepherds have enough to do in preventing their flocks straying away, and in supplying them with hay once or twice in the day, according to the severity of the weather; for wading through deep snow, with a heavy load on the head or shoulders, and often where the ground is hilly and broken, is a very laborious business.

Though there are neither fences nor other landmarks on those extensive mountain-ranges, from long usage, or some supposed right or claim, almost every sheep-farmer appears to consider that he possesses some peculiar privilege to the pasturage of that part of the common on which his flock usually feeds. Hence these flocks are rarely much intermixed with each other, the owners or their shepherds taking the liberty to drive or frighten away such of their neighbour's sheep as chance to mix among their own. Although this sort of arbitrary exclusiveness occasionally leads to bickerings and animosities between the parties whose flocks come thus in collision, it certainly prevents a great deal of trouble in separating and assorting at the seasons of sheep-washing, sheep-shearing, sheep-salving, &c., when each flock has necessarily to be divested of all intruders. It does not often happen that these extensive commons are overstocked, notwithstanding there being no limit to the number of sheep in any farmer's flock; but since the pasturage is of so poor a nature that, even when there is abundance of room, and to spare, for all the sheep that may be kept, the flocks never arrive at a high state of condition—nothing like that of fitting them for the shambles,—in case of any crowding or overstocking taking place, the reduced condition of the whole would be a serious consideration to all the parties concerned.

Though sheep, like most other animals, appear to be endowed with a certain degree of instinct, yet it does not follow, as a matter of course, that it always operates towards ensuring their safety. Persons who have had the most frequent opportunities of observing them generally, appear to have come to this conclusion, that when a storm is approaching they are seldom taken by surprise; or, in fact, before it actually comes on, they have endeavoured to find a place to shelter themselves from its fury: but in cases of snow-storms among the mountains, it very generally happens that the places of shelter from the bitter and piercing blast are places fraught with the greatest danger, for it is there that the drifting snow accumulates in vast masses; and while the flocks that have sought shelter are comparatively warm and comfortable, probably before they are aware the drift will have become piled up in such a manner as to render all attempts to retreat impracticable even were they inclined to do so. Thus it sometimes happens that in the space of a very few hours some scores, nay, perhaps hundreds, of sheep become buried beneath the snow to a depth of several feet. In most parts of these mountain-regions, where the hills are pretty steep, their sides are usually furrowed by several clefts, or deep and narrow ravines, down which trickle the waters of small springs that commonly have their rise in the upper parts of the mountain. The spaces along the sides of the hills, between these respective furrows or dells, for the most part are smooth and bare; so that at the approach of a snow-storm, should these places be resorted to by the flocks as places of shelter, they are soon buried to a considerable depth, since all the snow that falls on the smooth portions of the mountain is hurled into these dangerous ravines.

When a snow-storm comes on unexpectedly, the losses in the flocks of sheep are generally the greatest; for when it is foreseen, the shepherds are on the alert; and though it may not be within their power to prevent some portion of the flock being buried (overblown, as they call it) beneath the snow, yet, in most cases, they are aware of the situation the missing sheep occupied when the storm came on, and consequently know pretty well where to search the drifts for them. When the snow falls extremely light and feathery, the drift will hardly sustain a person's weight for a day or two afterwards, but in such cases there is not much danger of the sheep being suffocated under it; but when it falls in a softer state, but yet light enough to be drifted by a strong wind, the drift at once becomes consolidated and heavy, and then it is that there exists great danger of the sheep being quickly smothered.

There are two methods pursued in searching for the missing sheep when a snow-storm has subsided; one of them with dogs,—sheep-setters, or, as they are sometimes called, sheep-finders; the other, thus: three or four persons go in company, carrying with them a couple of long smooth poles, and also some spades or shovels. Those that carry the poles, walk along the drifted snow beneath which they suspect some of the sheep are buried, frequently pushing their poles gently through the snow, in order to ascertain, by the touch, the presence of the missing sheep; when, having made the discovery of one or more, the shovels are employed in opening a way by which to liberate the innocent prisoners. Persons accustomed to this prodding (probing) for sheep, as it is called, can readily distinguish by the touch of the pole the woolly coat of a sheep from any other substance,—even from the bushy and elastic heath, or the softer bent and mountain moss. This mode of search, however, is a slow and tedious process where there is a considerable breadth of drift, a great deal of time

necessarily being consumed in carefully examining a comparatively small space. Besides, it sometimes happens that the drifts are so deep that an ordinary pole will hardly penetrate them to the bottom, and in that case the system becomes altogether useless.

The employment of dogs to find the lost sheep is by far the better plan, where it can be effected. The sheep-setter is of no particular breed, though, for the most part, these dogs belong to the cur species. But there are so many varieties of the cur—or, at all events, so many coming under that very general term, that it would be impossible to define what peculiar class my father's dog, Corby the sheep-finder, belonged to. He was large and black, strong-limbed, long and lean bodied, shaggy-coated, with a little white on the breast, as well as between the eyes. His ears were precisely those of the common cur, and his tail—for he was not tailless—was both large and long. Corby from his puppyhood was a favourite in the family, certainly not on account of personal attractions, for these were by no means in his favour, but from sundry good qualities that he was early discovered to possess. He was docile, sagacious, courageous, and faithful, and when he grew up he exhibited an extraordinary sense of smelling, particularly as regarded sheep, and hence he soon became the most renowned sheep-setter through a wide range of country. This rendered him of so much account that it in a manner changed his destiny, for having been brought up with no other view than that of his being employed as an ordinary shepherd's dog, his superior qualities soon procured for him a higher distinction, and he became a privileged character in the sitting-room and parlour; scarcely any services were required of him, except after a severe snow-storm, when he was called upon to exercise his vocation, which, during many years, he lived to do, and with wonderful success.

It was not only upon our own farm and flock that Corby exercised the extraordinary powers nature had endowed him with, for his fame as a sheep-finder extended through all the surrounding parishes; and many were the messages and requests that his owner would permit him to be taken to the distant parts of the upland country, where portions of the sheep-flocks were often buried beneath the snow. We had a servant-boy, to whom the dog was much attached, and when it was convenient to spare the latter to exercise his abilities for the benefit of our neighbours, the former usually accompanied him, for it was not to be supposed that so faithful and sagacious a creature would voluntarily accompany entire strangers. Money, of course, my father would never accept for Corby's services, but the boy that used to accompany the sheep-finder was not so rigidly scrupulous, and many were the shillings and half-crowns that he pocketed in the course of a stormy winter.

The sagacious animal always took advantage of the wind, where that was practicable, and the moment he was told to 'seek the sheep—be careful,' his whole attention was bestowed upon those parts of the snow-drift that the parties pointed out to him. With his nose close to the surface of the snow, his eyes beaming with intelligence and anxiously watching every motion of the person that accompanied him, his ears in an attitude of listening, as if he expected to assist the sense of smelling by that of hearing, would he traverse the hard, soft, or slippery snowdrift. When he first ascertained that there *were* buried sheep somewhere in the vicinity, he would then examine, with peculiar caution, every part of the surrounding surface, until he appeared to have satisfied himself regarding the precise locality, and *then* he would commence scratching away the snow with all his might. This was a sure signal for those who carried the shovels to commence digging, but the dog was never satisfied unless he were allowed to continue his scratching, as if he were anxious to set the imprisoned sheep at liberty as soon as possible. Many dogs, and particularly those that have a cross of the terrier breed, that are occasionally employed in searching for sheep that have been overblown, the moment they get a sight of the sheep will endeavour to seize upon them with as much savageness as they would attack any wild animal; but Corby knew better than to act thus. In a single severe winter this dog has been known to have set (as finding the sheep in this manner is called) upwards of three hundred sheep, and though it may be true that a portion of them might have been discovered through other means, the probability is that he was the means of rescuing several scores that otherwise inevitably would have perished.

It might be supposed that where sheep are buried beneath eight or ten feet of compact snow, that they would be crushed beneath the surrounding weight, if not to immediate death, at least in so severe a manner that they could not long survive. This, however, is rarely the case; and except when the fall of snow is immediately succeeded by a thaw, and suffocation or drowning naturally ensues, very few, comparatively, perish on account of the great depth of the drift, the snow being so porous that respiration is carried on without much inconvenience. Experience has shown that, for the most part, when sheep that have sought shelter in some ravine or hollow perceive the snow rapidly increasing on and around them, they get upon their feet and attempt to shake it from their fleeces; and consequently in a standing position become finally enclosed in the drift. With the weaker portion of a flock this is seldom the case, for they commonly continue motionless where they have first lain down, in some sheltered situation, until the snow has accumulated so much that it would be impossible for them to rise did they make the attempt. The consequence of this is, that if they are not rescued for several days, they either perish through actual starvation, not being able to move at all or obtain the smallest particle of sustenance, or their limbs become stiff and paralyzed before death actually takes place. Those, however, that have been buried in the snow in a standing position, should they continue undiscovered several days, are generally found to have acquired sufficient room to turn themselves, and to be able to lie down and rise at pleasure; and where a few have happened to stand close together while the drift was forming, owing to the united warmth of their bodies, as well as their frequent movements, a rather considerable open space is commonly found surrounding them.

Instances have occurred of sheep being under the snow for three or four weeks, and still surviving, and even for longer periods. But in all such cases they have had the power of nibbling the short grass, grass-roots, and even a portion of the soil, on a space of a few superficial feet, through which means life has been sustained through so protracted a period of confinement. It has been ascertained also that, where sheep have actually been starved to death before they were discovered, extreme hunger had driven them to tear the wool from each other's backs, which only goes to prove the powerful influence of hunger even over these meek and innocent creatures. When sheep are discovered that have suffered a long confinement under the snow, on their being liberated it is necessary to administer food in small quantities, otherwise fatal consequences might ensue; and notwithstanding they may partly regain their wonted vigour in course of time, it rarely happens that such sheep ever afterwards appear in a perfectly healthy condition, and in the enjoyment of all their faculties.

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HORSE ARMOURY IN THE TOWER.—II. EDWARD I.

[Edward the First.]

MANY persons imagine, when they see this figure described in the catalogue as Edward I., that it represents the form and features of that monarch; but so far is this from being the case, that the very armour with which the figure is clothed has been made up piecemeal from several different suites, and we believe no part of the dress has been proved to have belonged to the king whose name appears on the flag above. The fact is, the armour is of a date as ancient as the age of Edward I., and was worn probably by some of the princes or high nobles of that time, and it has been thought desirable, in order to give an appearance of individuality to the whole, to affix the name of the monarch who reigned at the assumed period of its manufacture, so that its age and the times when it was worn in all the gloss of its original freshness might be recognised at once by the spectator. The chivalrous character of the times of Richard I., John, and the Henries, had caused considerable alterations to be made in the armour both of the knights and common soldiers, for although the latter were still but imperfectly protected from the attacks of their enemies, owing to their deficiency of defensive apparel, they were much more completely armed than they had hitherto been; yet armour suited for knights, and such as they could do battle in, was so expensive, that many knights were compelled to fight incompletely equipped, owing to their inability to purchase the necessary armour. We have an instance of this in the reign of Henry II., when of 130 knights willing to assist Dermod, king of Leinster, in the recovery of his kingdom, only 60 possessed coats of mail. In the reigns of the Edwards, arms and armour underwent considerable alterations and improvements, and it is probable that the expense of a full suite of armour was much less at this time, though it might be indefinitely increased by the additions of ornaments, chasing, &c. It was in the reign of the first Edward that the regulation was made requiring every man to be armed according to his station in life, that is to say, according to the amount of his property both in land and goods; those who possessed land of the value of 15*l.* and goods to the value of 40 marks, being required to have a habergeon (or coat of mail), an iron cap, a sword, knife, and horse; those possessed of land of the value of 40 shillings, to have a sword, bow, knife, and arrows; and so on.

It was in the thirteenth century that jousts and tournaments appear to have achieved some degree of that splen-

dour for which they afterwards became so popular. These amusements appear to have had their origin from the military exercises appointed for the instruction of the youth who were being educated for the profession of arms; but they soon became more serious employments, in which lives were often lost and innumerable hurts experienced. Some of these tournaments often assumed the appearance of a real battle, hundreds of warriors being engaged on both sides, and the deadly weapons of a conflict for life and death being employed. While we are looking upon the assumed figure of Edward I., we may recall old Thomas Walsingham's narrative of an adventure which happened to that monarch, showing the furious nature of such tournaments.

Edward I. was returning from Palestine to England through Savoy, when the earl of Chabloun (Count de Chalons) invited him to a tournament to which himself and many other knights were engaged. The king, with his followers, amounting to one thousand, accepted the challenge, although fatigued by the length of their journey, and only half the number of their antagonists. On the day appointed both parties met, some on foot, others on horseback, and being armed with swords, the engagement commenced. The earl, a most athletic man, singled out the king, and on his approach, throwing away his sword, cast his arms about the neck of the monarch, and used his utmost endeavour to pull him from his horse. Edward, on the other hand, finding the earl would not quit his hold, put spurs to his horse, and drew him from his saddle hanging to his neck, and then shaking him violently, threw him to the ground. The earl having recovered himself, and being remounted, attacked the king a second time, but finding himself disabled, gave up the contest, acknowledging him to be the conqueror. The knights of the earl's party were enraged when they saw their leader drawn from his horse, and ran upon the English with such violence, that the pastime assumed the tumultuous appearance of a battle-field. The English on their side repelled force by force: and Edward's archers mixing among the knights, cut the girths of the saddles or ripped up the bowels of the horses, brought their riders to the ground, made them prisoners, and at length drove the remainder of the earl's party from the field.

Such was the excess to which these amusements, originally instituted for the purpose of training the young nobility in the art of war, were sometimes carried; and so much were their original intents perverted, that at length it became necessary to repress them. But this is only one instance of the effect of that great characteristic of the manners of the thirteenth century,—the *enthusiasm*, which seems to have pervaded all classes, and which led to so much of the excess by which the actions of that age were distinguished. In war, literature, learning, religion, pleasure, dress, sports,—from the highest pursuits of man to the most trivial employments,—all were carried on with an enthusiasm which, if properly directed, might have led to the greatest results, but which, perverted as it was to wrong purposes, which the ignorance and barbarism of the age made to appear under a false light, only served to carry to excess the ideas which had already acquired too much importance. Thus learning became pedantry, religion degenerated into superstition, and pleasure led to licentiousness; and there are few periods of English history in which we find these extremes carried to such excess as in the times of which we are speaking.

But we are straying too far from the object before us, the figure of Edward I.; were we to review the leading events of this king's reign, and endeavour to find out the means by which they were brought about, or to trace the principles which governed the actions of those times, we should not only tire the patience of the warder who attends us, and test that of our friends, but should very probably perplex even ourselves. But amid all the warlike achievements of that active reign, the Crusades, the subjugation of the Welsh, the contests with Scotland, &c., which appear darkly shadowed forth as we gaze on the figure before us, a picture presents itself to our mind's eye with almost the vividness of reality, and on which we cannot resist the pleasure of lingering for a moment, even at the expense of our reader's patience. It is a picture of conjugal love and female tenderness:—the iron form before us forms part of the composition, but his stalwart figure, stretched on a couch, appears faint with pain,—pale, weak, and haggard from the effects of the poison which an assassin's weapon has infused into the wound inflicted deeply in his flesh; a female is by his side, her flaxen locks fall neglected over her shoulders, her face is pale with watching, her eyes moist with tears, and the blue veins of her white forehead swelled with anxiety; but a ray of hope now lights up her grief-worn features—she kneels before him, she applies her lips to his wound—she sucks out the deadly venom; yes, the poison is extracted, and Eleanor joys that the hazard of her own life has preserved that of her king and husband. Among the rough scenes which history is but too often obliged to depict, we dwell upon such pictures as the above with so much pleasure, that they become indelibly impressed on the mind, and the affection of Eleanor is remembered and often recurred to, when events of perhaps greater importance are totally forgotten.

DAIRIES AND DAIRYING IN AMERICA.

[From a Correspondent.]

Without attempting to enter upon an investigation of the various causes that appear to have influenced individuals in the selection of sites for their habitations, and situations to reside in, in many cases, judging from present appearances, the causes that must have originally influenced the parties in their selection of their places of abode no longer appear to exist, or else it seems quite clear that little either of taste, convenience, or discretion was exercised in those ages that have long since passed away. Without quitting our own island in search of examples, we cannot sojourn in scarcely any part of the country for a period sufficient to become conversant with the localities of the inhabitants generally, without arriving at the conviction that many of the solitary dwelling-houses, nay sometimes hamlets or whole villages, have nothing favourable in their sites, or at least that sites decidedly more favourable might have been selected than those which they now occupy. I am fully aware that circumstances, affecting not only individuals, but society generally, have greatly changed in this as well as in most other countries; but it is impossible to shut one's eyes against the absurdities that are continually practised in the rural districts, for there, when the old habitations become no longer tenantable on account of absolute decay, the new abodes are almost invariably erected on the identical sites of the old ones, or in their immediate vicinity, without the idea apparently ever entering into the heads of the parties of obtaining a new and better location.

Thinking upon this subject has brought to my mind a well-authenticated anecdote, which was related to me when on a visit to a friend residing close by the place where the circumstance occurred. The Great Valley is a fine district of country lying to the westward of Philadelphia from 20 to 40 miles, along which the Columbia railroad at present passes. One of the early settlers in the Great Valley was an Englishman of the name of Downing. The principal village, Downing Town, was named after him, and numerous descendants of his still continue residents in that neighbourhood. Downing, on first settling there, built himself a small log dwelling, as most of the first settlers do; but after the lapse of

a few years, his circumstances had so much improved, that he determined upon building a frame house, that being always considered a decided mark, in a new country, of a settler's getting on in the world. But Downing not having outlived prejudices which he had early imbibed in his native country, could not possibly think of any other situation for his new building but the precise spot that his humble log dwelling occupied, and consequently determined to erect the new abode there, and nowhere else. It fortunately, as it would seem, happened that the new frame building was intended to cover considerably more space than the old log one; hence the plan was adopted of surrounding the original one by the new frame, thereby allowing Downing and his family to reside in their old habitation until the new building was roofed in, and some part of it in a condition to be immediately occupied. This was actually done; and afterwards the log hovel was ejected, stick by stick, to the no small amusement of such of his neighbours as could not comprehend the feeling upon which their neighbour Downing acted. Downing after this continued prosperous as before, and finding that some of his neighbours had begun to entertain the ambition of dwelling in stone houses, and not feeling disposed to be left behind in the march of improvement, determined upon substituting a stone dwelling-house for his present frame one. But a difficulty here occurred that he probably had not thought of, for the plan he proposed for his stone building was no larger than the frame one; hence the impossibility of surrounding the frame building as he had formerly done the log one. But still he stuck firm to his purpose of erecting his third abode upon the precise place the first had occupied; to accomplish which he adopted an expedient that very few of his neighbours would have thought of resorting to. Having got all the materials in readiness for his stone building, and having provided a temporary shelter for his family and household goods, he set the frame building on fire, and in less than half an hour there was not a vestige of it remaining! The third residence of Downing in the Great Valley was then raised upon the exact site of the two former ones: his next and last resting-place was in the grave-yard belonging to the Friends' (Quakers') meeting-house, near the village of Downing Town, for friend Downing was a Quaker.

In America (I refer not, of course, to the towns and early-settled districts), when an adventurer pushes a-head into the native forests of that country in search of a location—a place to settle upon—nine times out of ten he is influenced in his choice of a situation to erect his rude log cabin upon, by the discovery of some spring of pure water or some clear and limpid stream. If he is poor, water, besides supplying a thousand other wants, will be the common beverage of himself and his family for at least several years, or at all events until his own industry shall have enabled him to make his own farm produce something better, or placed him in a situation to purchase from others such a beverage as he probably may prefer. And even should he happen to be in circumstances that, with ordinary management, will ensure him an abundance of the necessaries of life by the time that his wild lands can, according to the general order of things, be brought into a state of productiveness, still the immediate vicinity of a plentiful and never-failing supply of good and wholesome water has so many considerations to recommend it, that few, very few indeed, overlook so valuable a privilege. Owing to the greater degree of the heat of the climate of that country during the summers, the class of Americans that earn their bread by the sweat of the brow consume large quantities of water, and this even in districts where cider has already become tolerably abundant: as for malt-liquor, that is not yet sufficiently abundant in any part of the country to be a common beverage. It is, therefore, not only such as are members of temperance and cold-water societies that are in the habit of making water a frequent beverage; for even those that still indulge in their daily allowance of ardent spirits (indifferent whiskey or more indifferent New England rum), consume considerable quantities of water; for though they do not mix or dilute the spirits at the time they drink it, they never omit to cool their heated mouths and throats by washing it down with an immediate draught of cold water. So, for these reasons, and, among others, for some I propose presently to adduce, throughout the greater part of the present inhabited territory of the United States we find that whenever a lot of land is selected by an adventurous American settler, a good spring of water (if there be one on the lot) induces him to erect his dwelling near it, provided there is not some decided obstacle to deter him from so doing.

But it is not simply for family use that a never-failing spring is considered so desirable an object; for where the party has a view of converting the wilderness into a dairy-farm at some future period, the idea of building a dairy-house in connection with the spring early presents itself to him; for, owing to the hot summers, cool dairy-rooms are peculiarly desirable, if not absolutely necessary, and the dairy-room never should be very distant from the farm-house. Although the peculiar form and plan of the dairy-house depends upon various circumstances, the situation in which it has to be built, the taste and views of the builder, and the labour to be bestowed upon it, yet for the most part the common order of farmers usually adopt the following:—The well-head of some never-failing spring is encompassed by a building of hewn logs or stones; the latter being generally preferred where they can be conveniently procured; but frame or boarded buildings do not answer well, in consequence of their being soon heated by the sun's rays. To be sure, they may be shaded by rows of trees, but trees do not grow up into shade-trees in a single season. The size of the building is generally proportioned to the number of cows, but they seldom exceed eighteen or twenty feet in the square. The whole of the floor is flagged, or otherwise rendered smooth and level, parallel walks being raised a few inches above the level of the intermediate spaces, which spaces are set apart for rows of milk-pans, which are commonly made of tin, and capable of holding six or eight quarts each. The head of the spring is raised sufficiently (or else the floor of the building is sunk, to answer the same purpose), so that the water, when introduced into one of the channels where the milk-pans are deposited, shall flow with a gentle current through every other channel in the room, there being openings or communications between the channels, thereby keeping the milk at nearly the low degree of temperature of the spring itself; while from the constant current of the cold spring-water, the atmosphere is always regular and cool, and particularly sweet and untainted. Occasionally the dairy-house is not built immediately at the head of the spring, but in a situation several feet lower, the water being conveyed from the head of the spring in pipes placed underground, and entering the building a few feet above the level of the floor. It is then conducted round the sides of the dairy-room in shallow troughs, usually made of planks, in which the milk-pans are placed instead of in the channels before spoken of. To be sure, a single tier of troughs, though extending entirely round the room, would accommodate no more milk-pans than a channel circumscribing the floor of the same apartment, but where the water is introduced at the height of four feet or more above the floor of the room, without much difficulty, and without at all interfering with the interior of the room, a second range of troughs may be introduced where the extent of the dairy renders such a thing desirable. This latter plan for the dairy-room is certainly more convenient for the persons whose business it is to superintend the milk, there being no stooping required in

depositing the pans in their proper places, while the whole centre of the room is at liberty to be used as a depository for dairy utensils, or for whatever else may be considered desirable.

Dairy-houses of this description are of great importance to those farmers who turn their attention generally to butter-making; for then it is desirable that the milk should be kept cool and sweet, and in a pure atmosphere, by which means the greatest possible quantity of cream is given out, and the butter is of the very best quality. In some sections of the country, however, these spring-houses are only used as depositories for such articles as require to be kept cool and where the air is pure; for some butter-makers are in the habit of churning the milk daily, just as it is brought in from the cows. The supporters of this latter system allege two reasons for adopting their plan —one, that they obtain a greater quantity of butter; and the other, that the milk after churning is a much more valuable article for feeding hogs upon than skim-milk, to which purpose they are both usually applied. The latter part of the argument is generally believed, and in fact fully borne out by every-day experience: but I have good reason to believe that as regards the greater quantity of butter, no system which has ever yet been introduced in the practice of dairying has been found to surpass—nay, I doubt, if to equal—that of a compact, cool, cleanly, and well ventilated spring-house.

Notwithstanding there are some few districts that are noted for the cheese which they produce, yet on the whole it must be admitted that American cheese is greatly inferior to the cheese manufactured in several of our noted cheese counties, the climate of England not being subjected to equal extremes of heat and cold, both of which are known to be prejudicial to cheese-making. Probably their cheese being of an inferior quality to ours, may, in some measure, account for there being a great deal less cheese consumed among the Americans than among ourselves. But as regards the quality of butter, I have no hesitation in saying, that in various parts of that extensive continent I have partaken of the very best quality of butter that it is possible to conceive. And notwithstanding the hot summers, the dairy-women manage to deposit in firkins the surplus of their summer's produce, which during the subsequent winter is found to retain its original fine flavour, without having imbibed any peculiar or unpleasant degree of saltness.

In general the Americans may be said to be great admirers of mechanical improvements and new inventions; and this is not to be wondered at where labour is so dear; and hence the eagerness to obtain labour-saving machinery; and I know of no implement or utensil in that country for which more patents have been taken out than the *churn*. I am not about to attempt a description of the various patent churns that have come under my own inspection. But of one, however, I shall say a few words, from its being very generally adopted in various parts of the country; and from its being worked by a dog, it is usually called the dog-churn. A pretty large circular wheel is placed not quite horizontally, but inclining obliquely at a moderate angle. The dog is made to walk up the outer circle of this wheel, so that, on the principle of the tread-mill, his weight sets it in motion, and his position upon the wheel is such that as it moves from under him he finds it necessary to continue walking up the inclined plane. This large wheel turns a shaft that acts upon another wheel more immediately connected with the churn; for in short it acts in such a manner as to put the 'dashers' in motion within the churn, by which the operation of churning is performed. Some dogs become so reconciled—nay, I may say attached, to this species of daily exercise, that they will mount the wheel of their own accord, and eagerly enter upon their vocation, toiling and panting until the operation of churning is completed, and they are made to desist from their labours. Others require a considerable time to break them in, and never become so tractable and trustworthy as to be employed unless tied to a post or fastening intended for such a purpose. It may be remarked, that for the most part dogs employed in this way soon become fat; which probably arises from their being well fed, and constantly kept on the spot, without being allowed to take much exercise, save that upon the wheel during the daily process of churning.

Effects of Vegetables upon Different Animals.—Horses will not touch cruciferous plants, but will feed on reed grasses, amidst abundance of which goats have been known to starve; and these latter again will eat and grow fat on the water hemlock, which is a rank poison to other cattle. In like manner pigs will feed on henbane, while they are destroyed by common pepper; and the horse, which avoids the bland turnip, will grow fat on rhubarb.

Mistrustfulness of Uncivilized People.—It appears that the natives in this part of the river are such outrageous and lawless fellows, that they are mistrustful of each other even in the smallest communication, and we had an opportunity of seeing how far this was carried. The object of our visit was to purchase yams, and our people had succeeded in getting the villagers to bring some down to the canoes. These people, however, had armed themselves either with a gun or sword, as well as our own, and had no women among them, excepting an old one. Having arrived at the bank of the river, the old woman directed all the yams to be placed in a row before our people, and in distinct and separate bundles, and the owners to retire to a short distance, which order was implicitly obeyed. The purchaser now inspected the bundles, and having selected one to his satisfaction, which might contain the finest yams, placed what he considered to be its value by the side of it, consisting of cloth, flints, &c. The old lady looking on all the time, if, in her opinion, it was sufficient to give, she takes up the cloth and gives it to the owner of the bundle, and the purchaser likewise takes away the yams. But on the contrary, if the cloth, or whatever was thus offered by the purchaser, is not considered sufficient by the old woman, she allows it to remain a short time, to give him an opportunity of adding something else to his offer. If this were not done, the owner of the yams was directed by the old woman to take them and move them back out of the way, leaving what had been offered for them to be taken away also. All this was carried on without a word passing between the parties, and the purchase of a sufficient number of yams by our people occupied three hours. It was something quite novel to see two large parties of people bartering commodities in this manner; and the apparent unconcern and determination with which the old woman held out, when she considered the price offered for the yams not sufficient, was quite amusing. She knew our men must have yams; and with an ill grace they added anything to what they had already offered. The scene before us was altogether extraordinary. Many of the people belonging to the canoes were standing in a group on the bank of the river near them with muskets, swords, and spears in their hands; some with the articles with which they were about to make a purchase. A quantity of yams, arranged in large bundles placed in a row, separated them from another group, consisting of the villagers also armed, and both parties standing at a short distance from them, leaving a considerable space between. Here was stationed the old woman, who, with no little consequence, directed the whole affair by signs, either to her own party or ours, not a word being spoken by any one. We could not help thinking that everything in the largest market we have seen might have been disposed of in the time required for purchasing these yams, and that only ten days' journey up the river such a market would be found. This method of trading must have arisen either from the fear of quarrelling or from not understanding each others' language, which is difficult to suppose; but it seems to have been instituted by mutual agreement, for both parties quite understood how they were to act. This is the first time we have witnessed it.—*Lander's Journal of an Expedition to Explore the Niger.*

ALGERIA.

[Arab Family of Algeria.—From a French print by Wachsmut.]

Algeria, the name given by the French to their possessions in North Africa, comprises that part of the coast between Marocco on the west and Tunis on the east, which formerly constituted the Regency of Algier, and in antient times the kingdom of Numidia. The coast-line stretches about 500 miles from east to west, and the country varies in breadth from 200 miles south of the coast to a much shorter distance,—at least that was the extent of the territory over which the Deys exercised their sway. Their government was overthrown nearly ten years ago by the French, who have since held military possession of the country.* The maritime power of the Deys had been previously broken by Lord Exmouth, in the naval expedition against Algiers, in 1816: the Algerine corsairs have entirely ceased to harass the commerce of the Mediterranean, and their flag no longer spreads dismay amongst Christian mariners. The attempts of the French to colonise Algeria have not been very satisfactory. Perhaps our neighbours do not possess a very large share of the humble qualities which render colonization successful; or they have placed too much reliance upon the power of the sword, and thus have roused the warlike spirit of the native population. Probably it will be found that a combination of these causes has prevented them obtaining a firm footing in Africa.

The native population of Algeria is supposed to amount to nearly two millions, consisting of several races more or less marked by peculiarities. The Kabyles, Arabs, Moors, Cooloolis, and negroes from the interior, whatever may be their differences amongst each other, are all united against the invaders of their common country. The Kabyles are hardy mountaineers living in villages, and are as far advanced in agriculture and the common arts as the inhabitants of Southern Europe. They amount to one-half the population, and are the aborigines of the country; their Numidian character and habits being apparent notwithstanding their partial intermixture with the various nations that have successively conquered this part of Africa. The Kabyles who live on the Little Atlas and near the coast understand Arabic, but the remoter tribes know no language but their own. The Arabs who occupy the plains, and generally live under tents, are the remains of the great immigrations of their race from the East, and have generally preserved their national features and manners. The Moors constitute the bulk of the town population, and, as might be expected, have in a greater degree amalgamated with the people who have successively occupied the country, though the Arabic source from whence they spring is still strikingly apparent. The other divisions of the population are comparatively unimportant in point of numbers. The Cooloolis are descendants of Turks who married Christian slaves. The Jews are rather numerous in the towns.

Under the most favourable circumstances which could be conceived, the attempt to colonise North Africa by Europeans must have been attended with serious moral difficulties. There are no affinities of religion, habits, or ideas to bind together the Frank and Arabic races, so that even if the French were not regarded as invaders, there would be but little prospect of amalgamation. As it is, the Moors, Arabs, and Turks leave the towns on the approach of the French, and emigrants from the Balearic Islands, Malta, the coast of Italy, Germany, and even Switzerland, come in their place. Many of the French colonists have adopted the Arabic dress, but no instance has occurred in which the Arab has divested himself of the costume of his race, and habited himself in that of the invaders. The language of the conquered people (if we may yet term them such) is not understood, and this great cause of misapprehension, and often of injustice, aggravates their hostility. The children only of the lowest classes are permitted by their parents to learn the French language.

The position of the French in Africa neither resembles that of the Spanish, Portuguese, Dutch, or English in their attempts to form settlements. The Kabyles and Arabs have higher warlike qualities, and are more formidable enemies than the Indians of North and South America, the Hottentots, or the timid Hindoos. They

* No. 174 of the 'Penny Magazine' contains an historical and descriptive account of Algiers, with a view of the city

cannot be easily reduced to a servile state, have too high a spirit to submit to be exterminated, but maintain a hostile disposition which exhibits itself in sudden aggressions, and in constant vigilance that finds its reward in opportunities of vengeance. Thus the merely moral difficulties of colonization which difference of race interposes are increased and almost rendered insurmountable, and there is no security for life and property, the essential elements of prosperity. How can the cultivator pursue his labours with spirit and success if the crops are destroyed as soon as they ripen, while his life is never free from peril? The Kabyles rush down from their mountains, or the Arab horsemen sweep across the plain, butcher the colonist and his servants, and drive off the cattle. They will do this even in sight of the French camps; and often effect their purpose by means which it is nearly impossible to baffle. M. Blanqui, who has recently visited Algeria, and has made a Report of its present condition and prospects to one of the Academies, says that the commandant of the camp of Oued Lalleg, which is within sight of a garrison of 2500 men, was obliged to have a telescope constantly at his eye to watch the incursions of marauders on the plains, in order to send his patrols to drive them off; and it is scarcely safe in any part of Algeria to venture out of the towns without an escort.

The presence of the French, or of any other Franks in large numbers, even had they come as friends, would have occasioned a revolution in the circumstances of the natives of Algeria. The free living and expensive habits of Europeans are entirely opposite to the spare and meagre economy of the Arabs, and the effect of the former crowding into the towns has been to raise the price of all the necessaries of life; and thus many of the middle classes who lived upon fixed incomes derived from property or public offices can no longer maintain themselves in the independence to which they had been accustomed. Those who held public situations under the old government are in the worst condition, as their offices have been suppressed, and they have great difficulty in obtaining the means of subsistence. As some compensation for these evils, the state of the lower classes of natives is improving; they are becoming more industrious and are earning higher wages without relinquishing their parsimonious habits. A savings' bank ought to be established, in which they might deposit their surplus earnings, though perhaps it may be some time before their confidence in such an institution will be sufficiently strong to induce them to abandon the practice of burying their treasure.

The shock given to the tenure of property in Algeria has spread distress far and wide. Law-suits without end have taken place, and the difficulty of doing justice to the litigants has been very great. A spirit of wild speculation has increased the evil arising from the confusion which has more or less affected all titles to property. Houses and land have been bought and sold without the purchaser ever having seen the property. The government endeavoured to repress these proceedings by prohibiting purchases being made beyond certain limits. Thus the towns of Koleah and Blidah, the gardens in which were sold before these places were taken, have been surrounded by troops, and not one of the purchasers or even a soldier has been allowed to enter. As no person takes care of the property for which Europeans are paying ground-rent, it is neglected, and falls into dilapidation. Surely there might be regulations devised which would be efficacious, without resorting to such a despotic exercise of authority.

In reading M. Blanqui's Report, we see that the whole machinery of society in Algeria is in the greatest disorder; and probably the recent bold incursion of the Arabs has had its effect in determining the French to put an end to the anarchy which pervades their African possessions, by re-constructing a new system of government. No expense of blood or treasure will be spared in carrying their objects into effect. M. Blanqui's scheme of "driving off the native rural population and substituting an European one" is popular, and experience has shown the French that the Arabs cannot be made serviceable in the cultivation of the soil. On the first occupation of Algeria, however, the Arabs offered to work for lower wages than Europeans, and the services of the latter being very generally rejected, many were sent to France in a state of destitution, and others died in despair and misery. But the hope of profiting by the Arabs has proved delusive, and those colonists who do retain a few in their employment dare not permit them to sleep under their roof on account of their treacherous disposition. Generally speaking, the attempts to cultivate the soil have not succeeded, except where a few rich colonists have fortified and entrenched their farm-houses. Grazing has been the favourite department of husbandry; but wherever the European colonists have not concentrated themselves for the sake of mutual protection, they have been cut off.

The European agriculturists consist chiefly of Spaniards, Germans, and Italians, and it is singular that but few of the French have directed their industry to agriculture. M. Blanqui recommends that land should be sold to them at a low price, on condition of their concentrating themselves into parties capable of defending their property. Even the risk of being murdered by the Kabyles or Arabs has failed to prevent the dispersion of the colonists. M. Blanqui would not grant land to the indigent, as that would render it necessary for the government to make advances of stock, which, he remarks, but too often serves to encourage idle habits. "Isolation and the casting of the anchor in the wide sea must at all events be avoided;" but it is doubtful whether this recommendation is not solely founded upon considerations relating to the personal safety of the colonists. We do not perceive any allusion in his Report to that principle of colonization on which we have recently begun to act, and which is designed to establish the most desirable proportion between capital and labour. M. Blanqui would have the colonists disciplined like an army.

Algeria, we may be certain, has not been destitute of men, so common in all new colonies, who pursue the most unlikely schemes for acquiring wealth. Their labours, it is true, are not without value, though for a time they add nothing to the general wealth. Cultivation was scarcely practicable in Algeria beyond the reach of gun-shot of forts or encampments; but the system pursued under these disadvantageous circumstances was bad in itself. Indigo, pepper, cloves, cinnamon, and nutmegs have been tried, but have not succeeded, and can never be profitably cultivated. The cotton-plant does not answer, and it is useless to attempt to produce sugar and coffee. Attempts to naturalise the plants of Guiana have failed. On the other hand, the mulberry, the vine and olive, the orange, lemon, and banana succeed remarkably well; and tobacco thrives most luxuriantly, having been cut down in some parts like hay, and been followed by second crops as vigorous as the first. The *Cerealia* are wheat, barley, Indian corn, millet, durra, and rice. This part of Africa was celebrated for its fertility in ancient times; and wherever irrigation is practicable, the returns are abundant.

There is yet one other obstacle to the progress of agriculture in Algeria, in addition to those which are rather of a moral nature—and this is, the present insalubrity of some of the most fertile districts. In the plain of Metidja, which is the "promised land" of the colony, all new settlers are sure to be attacked with fever, and the mortality has been very great; so much so that it has not been deemed prudent to risk the health of the troops by establishing camps or posts amongst the colo-

nists; and those whom disease had spared have generally been murdered by the Arabs. M. Blanqui thinks that it will be impossible for colonists to establish themselves in the Metidja until it be rendered healthy by draining, a work which he would effect at the public expense. Lastly, we must take into account the natural defects of the country, the principal one perhaps being a want of rivers. Traffic, intercourse, and civilization are alike impeded in consequence of the absence of these channels of communication. Water is scarce in some districts, and timber is not abundant.

ON THE NATURE AND USES OF HONEY.

There are several articles in former volumes of the 'Penny Magazine'* relating to the management of bees, and to the mode of gathering the honey from the hives; these, taken collectively, convey a good deal of information on those subjects. In the present paper we shall consider the nature and properties of *honey*, and the uses to which it is applied after being removed from the hive.

"Honey," says Dr. A. T. Thomson, "is either smooth and homogeneous, like syrup, or it consists of brilliant granular crystals, dispersed through a clear uncrystallizable fluid; the colour varies from pure white to a deep brownish-yellow; its odour is somewhat aromatic; its taste sweet, sharp, and slightly acidulous. When long kept, honey acquires a deeper colour, and more sharpness of flavour and taste. It is completely soluble in water, but only partially in alcohol, which takes up the fluid or syrupous part, and leaves the crystallizable untouched."

Much has been written on the subject of bees; but it is not yet known how far the honey receives any of its peculiar properties within the body of the bee, or whether all of those properties are possessed by the juice before the insect gathers it. To understand this part of the subject, we must consider the mode in which the bee gathers the honey. Both the honey and the wax are procured from the flowers of plants; and it is believed that the honey is a sweet juice secreted in little vesicles, or glands, situated near the base of every petal. The bee inserts a kind of trunk into the vesicle, and gathers the juice in small drops, which are then deposited on the tongue: from thence it is conveyed to the œsophagus at the back of the mouth; a long canal leading from thence to a kind of bag or stomach where the juice is deposited. Now, the point of dispute among Apiarists is, whether or not, and to what extent, the juice is modified in the stomach of the bee. Leaving this question for future observers to decide, we will merely describe the manner, according to Mr. Polhill, in which the bee gets rid of his cargo of honey. The bee comes loaded to the cell, thrusts his head very deep into it, and discharges the honey from the bag, or secondary stomach, through the mouth. One bee succeeds another till the whole cell is filled. It appears that the bee first forms a crust or casing, with a honey thicker than common; the object of this seems to be to keep the body moist, and to prevent its running out by any accident; for every fresh cargo of honey is deposited *under* instead of *over* this crust. The bee, when he comes loaded to the cell, does not at once discharge the honey into it, but entering into the cell as deep as possible, puts forward the anterior pair of legs, and with them pierces a hole through the crust or cream. While this hole is kept open by the feet, the bee disgorges the honey in large drops from the mouth; these, falling into the hole made by the feet, mix with the mass below; and the bee, before it flies off, remodels the crust, and closes up the hole; this is regularly done by every bee that contributes to the general store of the cell.

Whether or not the juice or honey undergoes any change in the body of the insect, it is reasonable to suppose that it derives various qualities according to the flowers from whence it is taken. Such is found to be the case. The finest flavoured honey, called *virgin honey*, is that which has been collected from aromatic plants, and has been deposited in clean new cells. It has been asserted that the finest honey produced in Europe is that at Narbonne, and that it derives its excellence from the rosemary that abounds in the neighbourhood; but the peasants are said to have withdrawn their attention from bee-keeping in order to attend to their vineyards. Honey is also of good quality when the bees procure it from thyme or lavender; but it is bad when procured from buck-wheat. Xenophon speaks of the poisonous qualities of a species of honey procured in Asia; and Tournefort, two thousand years afterwards, concluded from observations which he made that the honey in question must have been procured from the flowers of the *Rhododendron Ponticum* and *Azalea Pontica*, two beautiful but poisonous plants which cover the mountainous district of Asia Minor. Poisonous honey is found in many parts of the world, and its effects on the system show themselves in vertigo, nausea, and delirium; while good honey, especially when new, acts as a laxative. But even good honey affects the system differently according to the district whence the bees derive it. The heather honey of Scotland is said to agree well with many persons who would suffer from even tasting the fine honey of Narbonne.

As to the consistence of honey, we may state that when it is taken from the honeycomb it is in a fluid state, but gradually thickens by age; and in cold weather there is deposited, if the quality be good, a firm and solid mass of honey, which is of more value than the softer portion which rises to the top. In England honey has seldom been known to assume a solid state while in the hives; and even out of them, if it remain in the combs, it will preserve its fluidity, clearness, and fine flavour for at least a year, if not exposed to a low temperature. The honey of hot climates is always in a fluid state.

The agreeable sweetness of honey is known to every one. It is sometimes used instead of sugar to sweeten various culinary preparations. It is also used instead of butter, spread on bread. Honey is one of the ingredients in that useful medicine *oxymel of squills*, the nature of which we may briefly describe. The squill is the bulb of a plant found on the shores of the Mediterranean; it is of an oval form, and is composed of fleshy concentric scales covered with a thin brown coat. From these bulbs is prepared *acetum scillæ*, or vinegar of squills. A pound of the squill bulb is dried, and steeped in six pints of dilute acetic acid; the steeping is effected in a close glass vessel, aided by heat, and continues for twenty-four hours. When the dregs have subsided, half a pint of proof spirit is added to the liquor. Lastly, to make *oxymel scillæ*, or oxymel of squills, three pounds of clarified honey are boiled in a glass vessel over a slow fire in two pints of the vinegar of squill. The action of oxymel of squill upon the system is as an expectorant, for which, in small doses, it is very useful.

Honey is also used medicinally under the names of *mel boracis* (honey of borax), *mel rosæ* (honey of roses), *oxymel simplex* (simple oxymel). The first is borate of soda mixed with honey; the second is prepared from honey, red rose petals, and boiling water; and the third is clarified honey boiled in dilute acetic acid. These are principally useful in complaints in the mouth and throat.

The use of honey as one of the ingredients in *drink* is of very ancient date. When fermented, honey-water obtains the name of mead, which is, in fact, honey-wine: indeed the Germans call it by that name (Honigwein). Mead is said to have been the principal beverage of the

* 'Penny Magazine,' vol. iii., p. 11; vol. iv., pp. 64-190; vol. vii., pp. 146, 171, 400, 408.

Britons before the use of malt liquor among them; and long after the introduction of the latter beverage, mead was a favourite drink. Under the name of metheglin it was frequently alluded to by old writers. Dryden has a couplet:—

> "T' allay the strength and hardness of the wine,
> Let with old Bacchus new Metheglin join."

Queen Elizabeth was so fond of mead, as to have had it made every year for her. Her receipt for it has been preserved, and is given by Dr. Bevan, in his interesting little volume on the Honey Bee:—Take of sweet-briar leaves and thyme each one bushel; rosemary half a bushel, bay leaves one peck. Scethe these ingredients in a furnace full of water (containing probably not less than 120 gallons): boil for half an hour: pour the whole into a vat, and when cooled to a proper temperature (about 75° Fahr.), strain. Add to every six gallons of the strained liquor a gallon of fine honey, and work the mixture together for half an hour. Repeat the stirring occasionally for two days; then boil the liquor afresh, skim it till it becomes clear, and return it to the vat to cool: when reduced to a proper temperature, pour it into a vessel from which fresh ale or beer has just been emptied; work it for three days, and tun. When fit to be stopped down, tie up a bag of beaten cloves and mace (about half an ounce of each) and suspend it in the liquor from the bung-hole. When it has stood for half a year, it will be fit for use. Such was the receipt.

In Wales, in ancient times, mead was held in very high repute; as appears from an ancient law, which has been given by Dr. Bevan, that — "There are three things in court which must be communicated to the king before they are made known to any other person: 1st, every sentence of the judge; 2nd, every new song; 3rd, every cask of mead." The mead-maker was the eleventh person in dignity at court, and took precedence of the physician. Besides the preparation of mead, our forefathers were accustomed to flavour their usual grape wines with honey and other ingredients. There were two kinds of spiced wines in use in England in the thirteenth century, called Hippocras and Clarry. The first consisted either of white or red wine, and the latter of claret, both mingled with honey and spices. Dr. Henderson, in his 'History of Wines,' speaks of a receipt still existing, which gives directions how "to make ypocrasse for lords with gynger, synamon, and graynes, sugour, and turesoll: and for comyn pepull, gynger, canell, longe peper, and claryffyed hony."

Mead formed the nectar of the Scandinavian nations, and was celebrated by their bards: it was the drink which they expected to quaff in heaven out of the skulls of their enemies; and was, as might be expected, liberally patronised on earth.

The northern nations of Europe have still retained a fondness for mead, or for some similar beverage made from honey. Dr. Granville tells us, in his 'Journey to St. Petersburg,' that he met in the streets of that city a man carrying, partly under his arm and partly fastened round his waist, a brass jar, carefully enveloped with flannel bandages, and having a spout with a brass cock at its upper end. He appeared to be distributing to the passengers some hot liquor in tumblers, which he kept in a species of trough affixed in front of his dress, and covered by a short apron. This man was called a Sbiteustchick, and the liquor which he sold, Sbiteue. Dr. G. accosted the man, and had a tumbler-full of the liquor, which he describes as having an agreeable taste, not unlike that of very sweet tea. On inquiry of the man, it was found to be prepared thus:—Eighteen pounds of honey are mixed with fifty quarts of hot water; this mixture, to which pepper is added by some, is drunk hot, with the further addition of boiling milk, which the seller carries about with him in another good-sized vessel.

It is evident that this beverage is very little other than hydromel, or honey-water, a simple drink often used in other countries. Sometimes refuse honey-combs are washed in water, after as much honey as possible has been extracted from them, and the water boiled for some time: it is tunned as soon as cold, bunged down in three or four days, and drunk a few weeks afterwards. In some parts of Wales, the refuse combs are brewed with malt, spices, &c., and the produce is called Braggot. A simple summer beverage is often made by mixing honey with acidulated water.

But mead differs from all these: mead is really a wine, and has undergone the process of fermentation. As it may be interesting to those who keep bees to know the manner in which mead is, in our own day, produced from honey, we will give a description from Dr. Bevan, the latest with which we are acquainted on the subject:—"To those who approve of its flavour, I recommend the following direction, which I have successfully followed for several years, having my home-made wines enriched with a considerable portion of foreign flavour:—Dissolve an ounce of cream of tartar in five gallons of boiling water; pour the solution off clear upon twenty pounds of fine honey; boil them together, and remove the scum as it rises. Toward the end of the boiling add an ounce of fine hops; about ten minutes afterwards, put the liquor into a tub to cool. When reduced to the temperature of 70° or 80° Fahr., according to the season, add a slice of bread toasted and coated over with a very little yeast: the smaller the quantity the better, for yeast invariably spoils the flavour of wines; and where there is a sufficiency of extractive matter in the ingredients employed, it should never be introduced: if fermented in wooden vessels, none is required. The liquor should now stand in a warm room, and be stirred occasionally. As soon as it begins to carry a head, it should be tunned, and the cask filled up from time to time from the reserve, till the fermentation has nearly subsided. It should now be bunged down, leaving open a small peg-hole; in a few days this may also be closed, and in about twelve months the wine will be fit to bottle."

The other modes in which honey may be brought to use need not occupy our attention.

Praise or Censure.—Speak not in high commendation of any man to his face, nor censure any man behind his back; but if thou knowest anything good of him, tell it unto others; if anything ill, tell it privately and prudently to himself.—*Burkitt.*

Depopulating Effects of Heathenism.—Hervey's Island, from which the group takes its name, is really composed of two small islets, 19° 18′ S., 158° 45′ W. long. It was discovered by Captain Cook, and by him named in honour of Captain Hervey, R.N., one of the lords of the Admiralty, and afterwards Earl of Bristol. It is surrounded by a reef, into which there is no entrance. I visited it in 1823, intending to place a native teacher there, as I expected to find a considerable population; but on learning that, by their frequent and exterminating wars, they had reduced themselves to about sixty in number, I did not fulfil my intention. Some six or seven years after this I visited the same island again, and found that this miserable remnant of the former population had fought so frequently and so desperately, that the only survivors were five men, three women, and a few children; and at that time there was a contention among them as to which should be king!—*Rev. John Williams's Missionary Enterprises.*

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* * The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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BRITISH AGRICULTURE.

JANUARY.

[January.—From an Anglo-Saxon Calendar.]

We here present the first of a series of papers, to be continued monthly in our Supplementary numbers, the object of which is to give a popular view of that subject in which, above all others, we are the most deeply concerned, namely, British Agriculture. This assertion can need but little proof, for it is evident that we are not only indebted to its operations for the greater part of our food, and for no inconsiderable portion of our clothing, but in a great measure also for the raw material of our gigantic woollen manufacture. To our Agricultural readers such a subject, if properly treated, must be interesting. We hope to make it no less so to all those who do not belong to that class. Historically viewed, the progress of Agriculture exhibits the progress of the population in comfort, and thus forms one of the most important chapters in the History of National Manners. Agriculture, too, has its poetical aspects; and even when the science of agriculture was in a much less flourishing condition than it is at present, the pastoral life of the farmer was considered among the happiest conditions in which man could be placed. The ordinary farmer is no speculator; he does not enter into wild and ambitious schemes which we may daily see practised in trade and commerce; hence he never lays his head upon his pillow under the painful apprehension that some change in state affairs, or some untoward freak of fortune, may render all his schemes abortive, and reduce him to a state of beggary before the sun goes down on the morrow. His chief aim and ambition is to live independent of the world; to be able to defray, with the fruits of his own industry, all just demands that may be brought against him; and, possessing the means of accomplishing this, he would not exchange conditions with the rulers of the land. But the farmer possesses one advantage which he probably does not estimate at its full value. It is his fortunate lot to inhale the pure uncontaminated breeze as it rolls in upon our island shores, and bearing on its balmy wings that inestimable treasure, health—a boon that pampered luxury seldom falls heir to, and whose value is beyond all arithmetical computation. Who is there that ever attempted to deny the charms of a country life? May we not daily see the man of business toiling through the best portion of his existence, in order, as the evening of life draws on, that he may be enabled to lay aside the cares and anxieties attendant on a business life? And of those who are so fortunate as not to be disappointed in accomplishing the views they set out with, where is it that they look for the evening of their lives to close? Certainly not amidst the noise, the bustle, the turmoil, the smoke, and the noisome exhalations and impurities consequent upon a dense population; but in—and the word has ever exercised a magical influence over them—IN THE COUNTRY. Nearly all our poets have also dilated upon the subject; but we can make room for an extract from one only, as faithful as it is beautiful.

"THE COUNTRY LIFE.

"Sweet country life, to such unknown,
Whose lives are others', not their own;
But, serving courts and cities, be
Less happy, less enjoying thee.
Thou never plough'st the ocean's foam
To seek and bring enough pepper home:
Nor to the Eastern Ind dost rove
To bring from thence the scorched clove;
Nor, with the loss of thy loved rest,
Bring'st home the ingot from the West:
No, thy ambition's master-piece
Flies no thought higher than a fleece;
Or how to pay thy hinds, and clear
All scores, and so to end the year:
But walk'st about thine own dear bounds,
Not envying others' larger grounds;
For well thou know'st, 'tis not the extent
Of land makes life, but sweet content:
When now the cock, the ploughman's horn,
Calls forth the lily-wristed morn,
Then to thy corn-fields thou dost go,
Which though well soiled, yet thou dost know
That the best compost for the lands
Is the wise master's feet and hands;
There at the plough thou find'st thy team,
With a hind whistling there to them;
And cheer'st them up, by singing how
The kingdom's portion is the plough:
This done, then to th' enamell'd meads
Thou go'st, and as thy foot there treads,
Thou see'st a present God-like power
Imprinted in each herb and flower;
And smell'st the breath of great-ly'd kine,
Sweet as the blossoms of the vine;
Here thou behold'st thy large sleek neat
Into the dew-laps up in meat;
And as thou look'st the wanton steer,
The heifer, cow, and ox draw near,
To make a pleasing pastime there:
These seen, thou go'st to view thy flocks
Of sheep, safe from the wolf and fox,
And find'st their bellies there as full
Of short sweet grass, as backs with wool,
And leav'st them, as they feed and fill,
A shepherd piping on a hill.
For sports, for pageantry, and plays,
Thou hast thy eves and holydays,
On which the young men and maids meet
To exercise their dancing feet,
Tripping the comely country round,
With daffodils and daisies crown'd.
Thy wakes, thy quintels, here thou hast,
Thy May-poles too with garlands grac'd,
Thy morris-dance, thy Whitsun-ale,
Thy sheering-feast, which never fail,
Thy harvest-home, thy wassail bowl,
That's tost up after fox i' th' hole,
Thy mummeries, thy twelfth-tide kings
And queens, thy Christmas revellings,
Thy nut-brown mirth, thy russet wit,
And no man pays too dear for it:
To these thou hast thy times to go
And trace the hare i' th' treacherous snow;
Thy witty wiles to draw, and get
The lark into the trammel net;
Thou hast thy cockrooch and thy glade
To take the precious pheasant made;
Thy lime-twigs, snares, and pit-falls there
To catch the pilfering birds, not men.
O happy life! if that their good
The husbandmen but understood;
Who all the day themselves do please,
And younglings with such sports as these;
And, lying down, have nought t' affright
Sweet sleep, that makes more short the night."*

January, of all the months of the year, is the season when vegetation, in our climate at least, may be considered to be in its most dormant state. Our seasons, however, vary so remarkably, that it happens on some occasions that even *this*, which has a right to be considered the coldest month of the year, presents us with green fields, and imparts to our gardens and pleasure-grounds all the appearances of returning spring. But it too frequently happens when such is the case—when a premature display of young shoots and budding flowers has been called forth by the unusual mildness of the autumn,—that bitter blasts and biting frosts ensue, to the complete annihilation of every tender bud and blade,—and the natural consequence is, that when the mild breezes of spring return in their ordinary course, the injury done to the young plants that had put forth their unseasonable shoots will be but too apparent, and the injurious effect will, in all probability, continue through the whole of the ensuing season. Sometimes, however, the winter—

—— "A winter such as when birds die
In the deep forests, and the fishes lie
Stiffen'd in the translucent ice; which makes
Even the mud and slime of the warm lakes
A wrinkled clod as hard as brick; and when
Among their children, comfortable men
Gather about great fires, and yet feel cold;"*—

will set in long before either the husbandman or gardener expected it; and in this case, like the previous one, much injury commonly ensues to agriculture. For when this happens, the farmer's late crops may be seriously injured; while the more delicate plants and shrubs, which require the gardener's protection during the more severe part of the season, are taken unawares, and fall a sacrifice to the inclemency of the weather. It is a well authenticated fact, that in this island the winters, on the whole, are much milder than formerly. Indeed, if we refer back to the chronological account of past times, we shall there find recorded seasons of frost, of a continuance and intensity far beyond anything that has occurred of late years; and it may not be out of place to inform the reader, that the winter of 1739 and 1740—just a century ago—was one of the most severe seasons that we find upon record.

Although horticulture (the art of cultivating gardens) does not absolutely belong to an agricultural subject taken in the abstract, yet it is so closely connected under the improved system of agriculture—where our most highly cultivated farms assume a garden-like appearance, while our extensive market-gardens stretch over large fields and enclosures—that should anything remarkable occur in connection with the latter, it can hardly be considered a departure from our professed object in this series of papers, should horticultural notices occasionally be introduced. Indeed, in connection with our towns and cities, the members of the whole community are more or less interested in anything that materially affects the market-gardens; for since no inconsiderable portion of the daily supply of the common necessaries of life is derived from that source, the people would only be affected in a precisely similar way—though, perhaps, to a somewhat greater extent—if some dire misfortune should happen to the crops of the farmer. Some of our readers will recollect the late frosts that occurred about the middle of the month of May last, when the gardens (particularly the fruit-gardens) around the metropolis suffered very severely. The consequence was, that both early fruit and vegetables, owing to their scarceness, were considerably enhanced in value, whereby the whole body of consumers were more or less affected.

Having spoken of the bad effect of seasons falling out of season,—something may be said regarding the state of the weather during the greater part of the past autumn, because the effect, viewed prospectively, likely to result therefrom, may already be pretty well ascertained. In many districts of the country where the land lies low, the streams and rivers were so swollen during November and December, that much ground intended for a wheat crop remains unsown at the present time. Hence it is calculated, that should all the wheat in the ground yield a full average crop at next harvest-time, there is reason to believe that a considerable deficiency may be the probable consequence. This may turn out a greater

* Robert Herrick's 'Hesperides,' 1648

* Shelley's 'Miscellaneous Poems—Summer and Winter.'

misfortune to the community at large than to those farmers who have been placed in this situation; because the probable deficiency may have the effect of raising the price of wheat in that degree, that the portion of their farms they had managed to get the seed into may yield them something like an equal profit with what the whole would have done, provided there had been a general full crop. Moreover, the land upon which it had been their intention to sow wheat will now be sown with barley, or planted with some other crop; and although none of these may turn so profitable as a wheat-crop would have done, yet the loss, even upon such lands, will thus be considerably reduced. One thing, however, ought to be borne in mind, for in agriculture it is well understood—that when a farmer is under the necessity of altering his system of crops, even for a single season, it deranges his whole plan for several succeeding years.

Having mentioned this, it may be as well to state in this place, that in all the districts where agriculture is in the most flourishing condition, regular systems of cropping have been established, and these rotations of crops are scarcely ever departed from, except for the sake of trying some experiment, or from some such cause as the one already mentioned. Whether these systems are invariably the best that possibly could exist is a question which need not here be discussed. Indeed some of them seem to be founded altogether upon the principle of keeping the soil from becoming impoverished by the improvident or too anxious farmer. So that to compel farmers to crop or cultivate their lands after a certain fashion, when the lease of the farm is drawn up, a clause is inserted which binds the tenant to pursue a particular system or rotation of crops. Yet, notwithstanding this, there has been nothing like a general and universal system adopted, for two reasons, principally,—first, that there are so many different qualities of soil, and such a diversity of situations, and the means of procuring suitable manure vary so materially, that to raise similar crops in different situations would require a twofold outlay of labour and capital in the one to what would be required in the other; and, secondly, even among those who rank among the leading agriculturists of the present day, there is, upon many points, such a diversity of opinion with regard to systems of cropping certain sorts of land, that the practice we find generally prevailing in one section of country will, probably, scarcely be known anything of by the farming community generally at the distance of 50 or 100 miles.

There are numerous districts in Great Britain, particularly in those parts where wheaten bread is not commonly used, but bread or cakes made of rye, barley, or oats, that some thirty or thirty-five years ago did not produce a single blade of wheat. In fact, the inhabitants would almost as soon have thought of raising a crop of rice, or any other outlandish production, as a wheat-crop; but where, of late years, very good crops of wheat have been raised in the place of indifferent oats and that coarse species of barley commonly known by the name of big. The parties who were the first to attempt the culture of wheat, in the districts alluded to, were invariably laughed at and ridiculed; and, probably feeling a doubt of ultimate success, those early experiments were made upon a small scale, and with wheat sown early in the spring. Finding, however, that by careful management they invariably obtained tolerable crops of this inferior sort of grain, they were encouraged to go more into the regular management of cultivating wheat-crops; when, to the utter astonishment, as well as the no little disappointment of their scoffing neighbours, it became satisfactorily proved that very fair crops of wheat might be grown; and thus several of the districts alluded to have ever since continued to extend the cultivation of this most valuable production.

It is not, however, every quality of soil that is adapted to the growth of wheat; neither is it in every situation that wheat-crops would arrive at maturity, owing to the bleakness or the great elevation; for, should the soil be favourable, the altitude above the level of the sea may be such, even in our own island, that there would be but little chance of its arriving at maturity before the tempestuous autumnal weather came on; when, in our humid atmosphere, vapours, clouds, and rains greatly infest our hill-districts; so that in those situations where it is considered desirable to introduce the plough at all, oats, from their hardier nature, are sown in preference to any other sort of grain.

In the dales and valleys among several of our mountain ranges we frequently meet with a succession of small grass-farms where the plough never comes, and where the only part of the soil cultivated is a small patch of potato-ground, which is invariably dug with the spade. To be sure, it often happens that the enclosed ground on such dale-farms is so steep that ploughing would be a very difficult operation; hence they are ever kept under grass—grass the spontaneous growth of the soil, of which the crops they yield are usually light. It may be remarked, however, that, even in many such situations, it is quite apparent that at some unknown but very distant period the plough has certainly been used, for there are still the remains of dim furrows, in such regular order and to so great an extent, that nothing but the plough could possibly have made them. At what precise period this took place we have little to guide us beyond conjecture, although undoubtedly there must have existed some powerful reason for cultivating ground that could not be done but with great difficulty, and at an expense which, in our days, would ill requite the farmer who should attempt it.

It has already been observed that, of all the months in the year, this is peculiarly the one in which the ground is suffered to rest. Indeed, in what may be considered favourable seasons for agriculture generally, the intensity of the frost is such that the plough is laid aside until a more convenient season. However, on arable farms there is seldom any long period of the year that the plough is altogether idle; nothing but the extreme wetness of the ground by a continuance of rain, or hard frosts, or a considerable covering of snow, prevents the ploughman from exercising his calling upon one part or other of the farm; for where a specific quantity of work has to be performed by a limited number of teams, horses or oxen, it becomes a matter of simple calculation to arrive at the amount of time that may be devoted to other affairs, without interfering with the more regular management of the ploughing department; for where the principal, whether it be the farmer himself, his bailiff, or head ploughman, is aware of the number of acres under tillage, and what portion of the whole is intended for each sort of grain, green-crop, or fallow, he can calculate pretty correctly the amount of team-work that will have to be bestowed upon each, and therefore arrive at the amount of spare time (time not taken up in ploughing, harrowing, &c.) during the ensuing season. Something, however, depends upon the nature of the season itself; for where the soil is naturally of a cold and moist nature, and the spring and early part of summer happen to be rainy, then not only will the ordinary plough-work be somewhat retarded, but on those parts where weeds and grass-roots had to be destroyed by the usual means of fallowing, it may happen that one or two *extra* ploughings will be necessary before the desired effect can be produced. Several other instances might be given of causes that might operate to increase farm labour; but this will suffice to show that it may happen that during this month the plough may or may not be advantageously put in operation, and yet without any material hurt or prejudice to the general interests of farming.

Among our Saxon ancestors, however, who sowed their

wheat in ths spring, this month was one of the busiest of the year, and generally used for the purposes of ploughing; and accordingly, in more than one of the Saxon calendars, it is given to represent the character of this month. One of these representations has been placed at the head of this article.* Oxen were then used for agricultural purposes, the use of horses being forbidden. But although there was some division of employment, seed-time and harvest formed the two great periods of exertion, and there were but few agricultural operations to mark the characters of the other periods of the year. This will be seen from the following list of the illustrations in one of those Calendars.

In January are men ploughing with four oxen; one drives, another holds the plough, and another scatters seeds.

In February men are represented as cutting or pruning trees, of which some resemble vines.

In March one is digging, another is with a pickaxe, and a third is sowing.

In April three persons are pictured as sitting and drinking, with two attendants; another is pouring out liquor into a horn; and another is holding a horn to his mouth.

In May a shepherd is sitting; his flocks are about, and one man has a lamb in his arms; other persons are looking on.

In June some are reaping with a sickle, and some putting the corn into a cart. A man is blowing a horn while they are working.

In July they are felling trees.

In August they are mowing.

In September is a boar-hunting.

In October is hawking.

In November a smithery is shown.

In December two men are threshing, others are carrying the grain in a basket; one has a measure, as if to ascertain the quantity; and another, on a notched stick, seems to be marking what is measured and taken away.

We also give another illustration from a Saxon MS.,* which shows nearly all the agricultural processes for the year.

[Ploughing, Sowing, Mowing, Gleaning, Measuring Corn, and Harvest-Supper.]

One of the necessary things to be performed upon the farm when snow is on the ground, or when the frost is hard, is the removing of the various sorts of manure to the place or into the vicinity where it is intended to be applied. On grass-farms it is commonly carried at once to the place where it is wanted, and set out into moderate-sized heaps from the waggon or cart, when, some time afterwards, it is spread equally over the entire surface. But on tillage-farms, at this season of the year, it is usually piled up in compost heaps containing many waggon-loads each, and there left to rot until the time arrives for its being distributed, in the manner likely to answer the best purpose, to the crops it was originally intended for. Besides hauling out the manure, where draining and ditching are required, this is the season for employing such hands as are not wanted in the other departments of farm labour. Thrashing out the grain is another business in full operation; and should the weather be seasonable, that is, frosty, the corn is more easily thrashed, and in better condition for the market, than when the weather is damp or rainy. Should the season be unusually severe, farm-stock will require more attention than on ordinary occasions; and notwithstanding agricultural pursuits, properly speaking, may be nearly at a stand, the people employed about the farm will always find some work or other to be done; for, in fact, there is no season of idleness on a large farm.

In olden times, however, this by no means was the case, for during the greater portion of this month the Christmas festivities and amusements were still persevered in; and even at the present day, in many of those remote and secluded districts where the improved systems of farming, as well as the improvement of the human mind, appear to have made the slowest progress, we find that what the inhabitants term "Christmas Time" is considered as extending past the middle of January, or about four weeks from the commencement of *New* Christmas.

Notwithstanding that the festivities which were once in vogue at this season of the year have, in a great measure, deserted the halls where "the yule-log blazed and the ale passed round," there seems little doubt of there being more of the reality of the olden time remaining in the rural districts than in the towns and cities; for in populous communities Christmas is reduced to grotesque buffoonery and mimic pantomime—to family dining parties, composed of two or three generations—to the exhibition and then the demolition of the twelfth-night cake—and thus endeth the once joyous season of Christmas: whereas in many country districts every little

* From 'Saxon Calendar' in British Museum, 'Cotton MS. Tib.,' b. 5. The ornaments and other figures of the engraving are also composed from Saxon originals.

* Harl. MS., 603.

road-side alehouse or village inn has its merry night or Christmas dance, at which a considerable portion of the population assembles, both male and female; and should the neighbourhood afford two classes of society, on some other occasion than that set apart for the *public* meeting, the better sort meet together in the same place, dignifying, however, their meeting with the name of ball or assembly.

Among the various duties devolving in the early season of the year upon those who are connected with large farms is the care of the sheep. The terrible snow tempests to which the Highlands of Scotland are subject have been already noticed in this publication;* and in the mountainous districts generally, although the weather neither be stormy nor the frost severe, the changes are sometimes so rapid, that it behoves the shepherd to be ever on the watch. Such violent and sudden snows will occasionally fall as to cause considerable loss of life even in an hour or two, through the sheep being overwhelmed by snow-drift in the hollows to which they may have fled for shelter. Fortunately "the sheep have generally an unerring foresight of the approach of these storms, or rather of the coming wind which will drift, and they will hurry away to some tried and approved shelter, when the shepherd sees not a cloud and dreams not of the wind."† If the fear of loss make the season an anxious one to the master, personal privation and danger frequently make it dreadful to the man. Whilst tending his fold, often he incurs the suffering, even if he escapes the fate, of the shepherd in Thomson's 'Seasons:'

> "On every nerve
> The deadly Winter seizes; shuts up sense,
> And o'er his inmost vitals creeping cold,
> Lays him along the snows a stiffened corse,
> Stretched out and bleaching in the northern blast"

To return. Hard frosts, however long continued, when the ground is bare, although injurious to some sorts of winter grain, are not nearly so injurious to flocks of sheep as a continuance of rainy weather; for though their food may be more scanty in the former case, unless supplied with hay from the barn or stack-yard, yet their fleeces being dry, they are kept warm and comfortable, and have no difficulty in finding dry places to lie down upon. Though therefore this month is often a trying season for sheep, February in general may be considered more so, and March, in late springs, the worst of all. Respecting flocks of sheep kept in the enclosed and warmer parts of the country, although they are less exposed to the rigour of the seasons, yet, being of a less hardy race, they also require care and attention. The food of the sheep and cattle is now often frozen, and

> "Every root is found
> A rolling mass of ice upon the ground;
> No tender ewe can break her nightly fast.
> No heifer strong begin the cold repast,
> Till Giles with ponderous beetle foremost go,
> And scattering splinters fly at every blow;
> When pressing round him, eager for the prize,
> From their mixed breath warm exhalations rise."‡

When early lambs are desirable for the supply of the market, this is the month when the yeaning has to be carefully looked after. A discerning farmer is at no loss to single out the ewes that are likely to yean their lambs early; and having made his selection, they are nightly folded near the homestead, where sheds are prepared to shelter them from the inclemency of the weather. Were not this attended to, and the ewes allowed to roam abroad as usual, most likely a considerable portion of the lambs would perish. The dams too, at this season of the year, are better fed than the ordinary store sheep on the farm, in order that they may yield their offspring a full supply of nourishment. Among farmers in general it is customary to fatten and sell off the early produce of their stock, both lambs and calves; but there seems a doubt whether, in the long run, this is the most prudent and profitable plan, for it is admitted amongst agriculturists that early calves and lambs commonly keep ahead of those that are produced later in the season, until they attain their full growth; and since both sheep and cattle of the improved breeds are now allowed to propagate their species at an early age, it seems no more than reasonable that such as have some months' advantage in point of age should produce a stronger and more valuable progeny.

This too is the season for curing hams and bacon. Hogs that are intended for pork by the farmers are generally slaughtered before winter sets in; but the latter part of December and the early part of this month may be considered the great season for the farmers killing off their fat hogs. The process of fattening swine varies much, the kind and quality of their food depending in a great measure upon the nature of the farm-produce of the different parts of the country. In some places potatoes and other vegetables raw, or better, steamed or boiled, with a small quantity of meal of one sort or another mixed therewith, is principally used. In other parts meal made from peas or beans, and in others again oatmeal is mostly made use of. Milk also is an excellent article for hogs; but skim-milk will not bring them to a proper state of fatness, and new milk is too valuable an article. Occasionally experiments have been tried with new milk, when grain was exorbitantly dear; and although the hogs got fat upon it, their flesh was far from being so hard and firm as when fed upon meal, and therefore not so valuable. Westmoreland hams, so highly prized in the metropolis and elsewhere by connoisseurs in hog's-flesh, are the hams of hogs fatted upon oatmeal. Most of them are what is called *dry-salted*, that is, they are not soused in pickle as most other hams are, but after a mixture of salt, saltpetre, and sugar has been repeatedly rubbed into the hams, they are afterwards hung up in the old-fashioned open chimneys to smoke and dry, where in a few weeks they become strongly impregnated with the peculiar flavour of peat-reek (the smoke of turf), and as black and sooty as the chimney itself.

The country firesides during the evenings of this period present many a jovial and ruddy group of faces. The jokes that pass round may be more practical than witty, and the laugh more obstreperous than well-timed, but the jokers and the laughers accomplish their object of making one another happy. Even here the careful shepherd's thoughts are with his flock: it is perhaps even necessary to go to some distant part of the farm to see if all be well. So, like Bloomfield's Farmer's Boy—

> "From the fireside with many a shrug he hies,
> Glad if the full-orbed moon salute his eyes,
> And through the unbroken stillness of the night
> Shed on his path her beams of cheering light.
> With sauntering step he climbs the distant stile,
> Whilst all around him wears a placid smile;
> There views the white-robed clouds in clusters driv'n,
> And all the glorious pageantry of heav'n.
> Low in the utmost boundary of the sight
> The rising vapours catch the silver light;
> Thence Fancy measures, as they parting fly,
> Which first will throw the shadow on the eye:
> Passing the source of light, and thence away,
> Succeeded still by brighter still than they.
> Far yet above these wafted clouds are seen
> (In a remoter sky yet more serene):
> Others detached in ranges through the air,
> Spotless as snow, and countless as they're fair,
> Scattered immensely wide from east to west,
> The beauteous semblance of a flock at rest."

In many parts of the country it used to be the custom among the farming classes for each family to kill a beeve

* Vol. viii., p. 74.
† Farmer's Series—Volume on Sheep
‡ 'Farmer's Boy.'

or two in the winter season, the greater portion of which was salted and cured, and hung up to dry, like the hams and flitches of bacon, so that, unless a family was rather numerous, the supply of hung-beef, in addition to a good stock of bacon, prevented the necessity of frequent visits to the butcher's stall during the spring and summer. It would not appear to be owing to any change of taste in the parties concerned that this old custom has been permitted to fall into disuse, for many of them still profess to have a taste for hung-beef; but farmers are better managers than they formerly were, and they find it pleasanter as well as more profitable to sell their fat stock to the butcher for its full market value, from whom they can, at all times and seasons, not only procure the precise quantity of meat they may stand in need of, but the precise part and quality they may prefer. It may be true that the cattle slaughtered at home were not always in a condition to command a good price from the butcher,—either that they were naturally inferior articles, or else there might have been a scarcity of suitable provender for fattening stock upon; but owing to the improved breeds of cattle, as well as the great change and improvements in farm-produce, few enterprising farmers will tolerate specimens of inferior stock on their premises, and still fewer would think of slaughtering half-fed animals where there is an abundance of suitable food for bringing all the cattle destined for the butcher to the most desirable degree of fatness.

The citizen of London who has never resided out of town during the last thirty or forty years, if he has been in the habit of regularly noticing the meat-market, must be aware of the increase of size in both cattle and sheep. It may be true that small sorts are still brought to the markets of the metropolis, and the beef of the Kyloe or Highland bullock is still much and deservedly esteemed; as are also Welsh and some other sorts of small mutton. But the aim of the agriculturist has been to increase the size in cattle, as well as to improve what are considered the good points in those intended for the butcher's stall; while in improving our flocks of sheep the main object has been to enlarge the carcass, where that could be effected without lessening the quantity or deteriorating the quality of the wool. The annual show of prize stock which takes place in London immediately preceding Christmas would perfectly astonish the farmers even of the last generation, were they alive to witness it. But when we calmly reflect upon the pains and expense which have been incurred in effecting all that has yet been achieved by the liberal promoters of agriculture, this favourable result will seem the less surprising.*

Persons unacquainted with the circumstances will scarcely credit the enormous prices that have sometimes been obtained for stock of improved breeds; and in order to show the eagerness that has occasionally been displayed in procuring crack articles in the farming line, two or three instances may be quoted. About thirty years ago a short-horned bull of the Durham breed was sold in public sale for 1000 guineas, and cows sold in the same sale for 400 guineas each; and not for the purpose of being exhibited as curiosities, but simply for the purpose of propagating their species. Even more surprising matters have happened as regards sheep. The late Mr. Bakewell, of Dishley, the founder, as he is called, of the *new* Leicester breed, at one period lent or let out his best rams by the season for 200 and 300 guineas each; and on one occasion he let two-thirds of the services of a single ram for one season for the extraordinary sum of 800 guineas! so that, calculating his own one-third share,—which he retained himself,—at the same rate, the income from this single sheep, for one season, was equal to 1200 guineas! But the breed of sheep, as well as of cattle, appears to have approached that state of comparative perfection, at least in many parts of the country, that it is scarcely probable that similar prices will ever again be paid by our agriculturists, unless something extraordinary and far beyond human calculation should happen to this country.

In all farming operations a due regard to order and regularity should be invariably observed; so that every one employed should not only know his own business well, but the proper time and season for the due performance of it. No two sorts of work or occupations should be allowed to interfere or clash with each other, or to a certainty at least one of them will be performed in a slovenly or disorderly manner. All should be as regular and systematic as if the whole business of the farm were regulated by some well-adjusted machine. To be engaged in different sorts of work out of the proper season (for there is a season for all things), particularly sowing and planting, to witness a profusion of weeds allowed to grow up and ripen their seeds, to notice rubbish and litter scattered about during the summer, are sure indications of slovenliness, if not of decidedly bad management. In winter to neglect the repairing and opening of ditches and drains where they require it, having the various yards well fenced and secured, the farming implements all properly secured and stowed away until such time as they may be wanted again in the ensuing spring or summer—and not left to rot in the fields where they happened to be last used, or stuck in gaps instead of proper fencing materials,—all too plainly indicate something wrong in the system.

Having made these few observations we will conclude by quoting what were considered "the twelve good properties of farming" in the time of the famous Tusser, poet, gentleman, and farmer:—

> "Good farm and well stored, good housing and dry,
> Good corn and good dairy, good market and nigh;
> Good shepherd, good tillman, good *Jack*, and good *Gill*,
> Make husband and housewife their coffers to fill."

In agriculture, where so many of the processes are dependent on the state of the weather, it is not to be wondered at that any means are adopted for obtaining a foresight respecting it. We trust that the belief in the ridiculous predictions of a Moore or a Murphy are gradually wearing out; but the only true source is observation, and farmers and shepherds no doubt evince great sagacity in applying their experience; but to make the observations really valuable, they should be recorded, for then only can they be certainly depended on. We have much pleasure in placing before our readers a specimen of such a journal, in the hope of its inducing agriculturists, as well as others, to follow the example:—

* From 1740 to about 1750, the population of the metropolis fluctuated very little; amounting, during the whole of that period, to about 670,000 or 675,000. Now, during the ten years ending with 1750, there were, at an average, about 74,000 head of cattle and about 570,000 head of sheep sold annually in Smithfield market. In 1831 the population had increased to 1,472,000, or in the ratio of about 218 per cent.; and at an average of the three years ending with 1831, 156,000 head of cattle and 1,238,000 head of sheep were annually sold in Smithfield; being an increase of 212 per cent. on the cattle, and of 217 per cent. on the sheep, as compared with the numbers sold in 1740-50. It consequently appears that the number of cattle and sheep consumed in London has increased, since 1740, in about the same proportion as the population. The weight of the animals has, however, a good deal more than doubled in the interval. In the earlier part of last century, the gross weight of the cattle sold at Smithfield did not, at an average, exceed 370 lbs., and that of the sheep did not exceed 28 lbs.; whereas, at present, the average weight of the cattle is estimated at about 800 lbs.; and that of the sheep at about 80 lbs. Hence, on the most moderate computation, it may be affirmed that the consumption of butcher's meat in the metropolis, as compared with the population, is twice as great at this moment as in 1740 or 1750.

A Journal of Natural Appearances and Occurrences in Farming, with some occasional Remarks on the Weather, &c., made at Farningham, near Dartford, Kent, until Michaelmas, 1817; and since at Trevereux, near Limpsfield, Surrey, by Henry Cox, Esq.

	Years.	Began to Sow Oats.	Butterfly first seen.	Bat first seen.	Finished Sowing.	Willow in bloom.	Swallow first seen.	Nightingale heard.	Cuckoo heard.	Blackthorn in bloom.	Whitethorn in bloom.	Hops polled.	First Swarm of Bees.	Hops Tied.	Began to Mow.	Finished Haying.	Wheat in Ear.	Began Reaping.	Finished Harvest.	Began Picking Hops.	Began Sowing Wheat.	Swallows Flight.	Finished Sowing Wheat.	First Ice seen.	First Snow.
FARNINGHAM.															*Sainfoin.*									
	1803	Mar. 2	Mar. 4	April 1	April 12	. .	April 9	April 13	May 1	May 1	May 20	. .	. .	. .	June 16	June 29	June 24	Aug. 5	Aug. 26	. .	Sept. 21	Sept. 25	Nov. 8	Nov. 6	Nov. 19
	1809	20	16	Mar. 17	27	. .	20	22	4	April 25	15	. .	. .	. .	24	July 15	July 1	10	Sept. 2	. .	15	20	18	Oct. 12	4
	1810	10	Feb. 28	Feb. 28	13	. .	18	21	April 22	30	20	. .	. .	. .	18	6	June 28	14	5	. .	30	Oct. 1	20	2	Dec. 20
	1811	11	Mar. 10	Mar. 20	Mar. 15	. .	21	13	22	20	6	. .	. .	. .	3	June 21	10	July 24	Aug. 26	. .	16	10	10	12	15
	1812	10	Feb. 20	April 20	April 11	. .	21	16	May 1	27	June 4	. .	. .	. .	24	July 8	July 1	Aug. 19	Sept. 9	. .	Oct. 20	5	30	Nov. 11	Nov. 16
	1813	20	25	June 4	26	. .	26	15	5	15	6	. .	. .	. .	22	4	June 22	12	9	. .	Sept. 28	Sept. 30	11	Oct. 20	16
	1814	25	April 2	April 10	12	. .	17	13	April 20	22	1	. .	. .	. .	28	13	July 4	21	7	. .	28	28	7	5	Dec. 25
	1815	4	Feb. 9	11	Mar. 18	. .	13	12	May 1	6	May 15	. .	. .	. .	10	June 24	June 22	9	Aug. 26	. .	Oct. 9	Oct. 1	4	20	19
	1816	11	Mar. 12	May 23	April 10	. .	23	19	April 22	May 12	June 10	. .	. .	. .	25	July 31	July 14	29	Oct. 12	. .	2	Sept. 14	19	25	Nov. 8
	1817	3	Feb. 19	Mar. 21	2	. .	21	May 2	May 4	April 28	8	. .	. .	. .	21	14	June 24	15	Sept. 10	. .	8	Oct. 13	22	20	Dec. 12
															Meadow Grass.									None till
	1818	30	Mar. 29	Feb. 14	Mar. 31	. .	16	April 23	April 25	25	May 23	. .	. .	. .	June 18	June 30	8	July 27	Aug. 12	Aug. 31	Sept. 29	15	Oct. 31	Nov. 20	Feb. 2.
	1819	17	15	Mar. 24	April 2	. .	6	10	15	10	12	. .	. .	. .	19	July 24	19	31	25	Sept. 8	Oct. 1	6	Nov. 19	Oct. 21	Oct. 22
	1820	13	11	30	22	. .	12	18	18	20	22	. .	. .	. .	July 3	31	25	Aug. 9	Sept. 13	13	2	1	6	Nov. 20	Nov. 13
	1821	22	11	16	25	. .	16	20	20	20	20	. .	. .	. .	]10	Aug. 13	July 9	21	19	10	Sept. 20	Sept. 26	8	30	None.
	1822	15	3	20	Mar. 22	Mar. 15	21	21	14	10	10	April 26	May 5	June 20	June 16	July 10	June 10	July 16	Aug. 8	2	27	28	14	17	Dec. 25
	1823	29	12	24	April 3	April 1	16	21	21	May 1	25	May 2	7	July 5	July 7	Aug. 15	19	Aug. 16	Sept. 20	26	Oct. 6	Oct. 2	Oct. 31	3	18
	1824	31	17	April 21	20	Mar. 30	14	24	25	3	June 5	6	. .	5	5	10	26	16	30	14	18	Sept. 27	Nov. 1	Oct. 12	None till Mar. 10
	1825	24	Feb. 21	Mar. 20	7	28	14	19	23	April 26	May 12	April 28	4	June 18	June 28	July 18	20	July 22	Aug. 21	See Remarks.	15	27	Oct. 26	26	Dec. 27
	1826	29	25	Feb. 9	6	16	19	16	22	12	10	26	16	16	26	18	21	23	15	4	4	20	3	Nov. 7	6
	1827	April 6	Mar. 13	Mar. 20	10	23	14	15	14	18	14	29	16	29	25	21	24	Aug. 3	28	14	8	10	1	1	Nov. 21
	1828	Mar. 25	9	10	10	16	13	16	24	19	18	May 2	June 6	30	29	Aug. 16	20	July 31	26	15	8	5	Oct. 28	8	None till Jan. 7
	1829	26	21	28	9	April 4	14	18	23	May 7	June 3	7	10	30	July 15	Sept. 1	24	Aug. 4	Oct. 6	21	12	1	31	Oct. 7	Oct. 6
	1830	April 5	5	2	8	Mar. 26	1	10	15	April 18	May 15	April 24	2	12	5	Aug. 2	26	9	Sept. 1	13	6	17	27	27	Dec. 16
	1831	11	7	April 10	16	22	14	12	12	20	20	May 2	. .	20	2	July 27	16	July 29	Aug. 22	Aug. 29	15	20	Nov. 3	Nov. 10	None.
TREVEREUX.	1832	2	9	Mar. 23	11	April 4	10	18	23 *last,* July 2	25	25	1	*First Crocus on Lawn.*	30	2	28	21	Aug. 4	Sept. 4	Sept. 10	16	13	Oct. 22	Dec. 16	Dec. 31
	1833	8	5	May 3	12	2	9	21	April 22 *last,* June 25	May 1	29	7	Feb. 18	July 2	June 29	29	18	July 31	Aug. 21	16	9	9	30	Nov. 26	None.
	1834	Mar. 24	9	April 7	8	Mar. 16	9	23	April 24 *last,* June 16	1	20	April 26	Jan. 22	12	18	30	16	23	12	15	1	1	Nov. 21	Oct. 23	Nov. 21
	1835	26	14	19	6	20	13	24	April 13 *last,* July 7	April 14	25	May 2	Feb. 24	June 24	July 1	25	15	27	15	4	14	Aug. 20	Oct. 19	26	11
	1836	April 16	19	16	19	21	19	22	April 18	27	June 5	4	Mar. 2	July 1	4	27	20	Aug. 10	Sept. 5	12	14	Sept. 10	24	29	Oct. 29
	1837	4	April 1	May 31	12	April 10	25	25	23 *last,* July 6	May 15	18	6	Feb. 15	June 22	5	24	July 2	14	4	11	9	20	Nov. 3	Nov. 7	Nov. 25
	1838	Mar. 31	Mar. 14	Mar. 20	6	3	17	23	May 3 *last,* July 11	17	6	10	Mar. 12	16	13	Aug. 10	1	13	1	19	8	21	Oct. 25	11	. .
	1839	8	3	24	12	10	20	22	April 25 *last,* July 8	6	8	6	2	20	8	3	June 25	7	14	16	8	6	Nov. 8	. .	. .

OCCASIONAL REMARKS.

1808. April 19, a heavy fall of snow for four hours—a fine productive harvest.

1809. Last week in April, very cold, wet, frosty, and unpleasant weather—May came in fine and hot.

1813. An immensely productive harvest, and a general thanksgiving for it.

1814. January 4, the deepest snow that has been known for forty years began—was some days falling—continued on the ground for five weeks—at places the drifts were fifteen feet high—the frost continued twelve weeks, to March 20.

1816. From April 12 to 15, snow remained on the ground, and the weather was severe and frosty. September 3, a severe frost which produced ice.

1817. The month of May very wet, succeeded in September by fine harvest weather.

1818. May 8, a deluge of rain fell, after which no more fell at or near Trevereux till September 5, being 17 weeks and 1 day, during which all vegetation was completely burnt up.

1819. October 22, snow six inches deep.

1822. No rain from May 2 to July 5, nine weeks of very hot days.

1823. Rain little or much every day from June 29 to August 15, forty-seven days.

1824. A very wet summer, but not cold; crops of corn light, of hay heavy.

1825. Sold the produce of twelve acres of hops for five shillings; the crop was gathered, and proved to be twenty-four pounds in weight.

1826 and 1827. Two fine summers.

1828. Very heavy rain every day from July 6 to August 14.

1829. Though the ninth of April is stated as the day on which oat-sowing was finished, yet an experiment was tried by sowing White-gate field with black tartar oats on the 13th of May; the weather was much against them at first, but they turned out well and were carried on the 6th of October, the last loading going into the barn white with snow.

—— Rain more or less every day from June 16 to September 20, being 96 days (except on four of them, 23rd and 24th of July, and 3rd and 4th September); the season was not particularly cold, but the wettest in my memory. (H. C.)

1830. A severe frost till February 7; March was fine, dry, and warm, without a storm or a shower; April 1 was snowy till noon, while a swallow was seen flying about at Trevereux.

1831. On the 6th of May occurred a most severe frost; the young shoots of the ash and oak were destroyed—fruit trees of all sorts were greatly injured, and even the meadow grass was checked to such a degree that it never recovered from its effects—ice was nearly half an inch thick on the ponds on the common.

Note.—A severe frost occurred on the night of May 28, 1819, but inferior in its effects to the last described.

1834. A fine, dry, warm summer.

1835. April 16 and 17, a fall of snow for two days.

—— Although the 20th of August was noted as the time of the first and largest flight of swallows, yet it was observed that many remained longer, and they were not all gone this year until October the 20th—there are always many stragglers which remain longer than the principal flight, and some few, which appear to have lost their instinct, remain until the winter kills them by starvation and cold.

1836. September 1, swallows almost all gone.

—— October 29, snow fell in a frosty state of weather, and remained on the ground a week.

—— December 24, much snow fell at night, which, in many places, being drifted, stopped the roads for several days.

1838. January 8, a very severe frost commenced, and it continued about five weeks, with some snow, the thermometer being 5 or 6 degrees below zero—most of the evergreen shrubs were killed down to the ground.

—— April 16, continued snow-storms until the 20th, and very cold.

—— September 10, swallows more than half gone.

1839. May 14th, small snow for 4 hours in the morning; and 15th and 16th much more, with severe frost at night.

—— September, an extremely wet month, and many floods: continued wet throughout the autumn,

—— At harvest this year a single grain of wheat planted in my garden in Oct., 1838, without any particular cultivation, was found to have produced 64 straws or tillers, all bearing wheat, the total number of grains being 2800; and the straw weighed, when thrashed, 14 ounces.

MONTHLY CALENDAR.—FEBRUARY—Second Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock bef. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h. m.		h. m.	h. m.
1 S	32	Salm. fish. b. in Scotl. Pheas.&Par. shoot. en.	7 42	13 55	4 46	27·6	7 m 4	2 a 3
2 *Su*	33	*4 Sun. af. Epiph. Pur.*	7 41	14 0	4 48	28·6	7 34	3 21
3 M	34	*of B.V.Mary.* Candlm.	7 39	14 7	4 50	●	7 55	4 43
4 Tu	35	. . .	7 37	14 13	4 52	0·9	8 12	6 4
5 W	36	. . .	7 36	14 19	4 53	1·9	8 25	7 25
6 Th	37	. . .	7 34	14 24	4 55	2 9	8 37	8 47
7 F	38	. . .	7 33	14 28	4 57	3·9	8 49	10 9
8 S	39	Half Quarter.	7 31	14 31	4 59	4·9	9 2	11 34
9 *Su*	40	5 *Sunday after Epiph.*	7 29	14 33	5 1	5·9	9 17	morn.
10 M	41	. . .	7 27	14 34	5 3	☽	9 38	1 2
11 Tu	42	. . .	7 25	14 35	5 4	7·9	10 7	2 30
12 W	43	. . .	7 24	14 35	3 6	8·9	10 49	3 54
13 Th	44	. . .	7 22	14 34	5 8	9·9	11 50	5 5
14 F	45	Valentine.	7 20	14 32	3 10	10·9	1 a 6	5 57
15 S	46	. . .	7 18	14 30	5 12	11·9	2 32	6 33
16 *Su*	47	*Septuagesima Sunday.*	7 16	14 27	5 14	12·9	3 59	6 57
17 M	48	. . .	7 14	14 23	5 15	○	5 23	7 15
18 Tu	49	. . .	7 12	14 18	5 17	14·9	6 43	7 29
19 W	50	. . .	7 10	14 13	5 19	15·9	7 59	7 41
20 Th	51	. . .	7 8	14 7	5 21	16·9	9 14	7 51
21 F	52	. . .	7 6	14 0	5 22	17·9	10 28	8 2
22 S	53	. . .	7 4	13 53	5 24	18·9	11 42	8 14
23 *Su*	54	*Sexagesima Sunday.*	7 2	13 45	5 26	19·9	morn.	8 29
24 M	55	*S. Matthias. D.of Camb.*	7 0	13 37	5 28	20·9	0 57	8 48
25 Tu	56	[*born* 1774.	6 58	13 28	5 30	☾	2 9	9 14
26 W	57	Cam. Lent Term div. n.	6 56	13 18	5 32	22 9	3 17	9 50
27 Th	58	. . .	6 54	13 8	5 34	23·9	4 15	10 39
28 F	59	. . .	6 51	12 57	5 35	24·9	5 0	11 43
29 S	60	. . .	6 49	12 46	5 37	25·9	5 34	0 a 57

Meteorological Averages.

Barometer. Ins.

Mean height	30·067
Highest .	30·820
Lowest .	29·170

Hygrometer. °

Mean dew-point	34·9
Highest .	49
Lowest .	20
Mean dryness	3·1
Mean greatest do. of day .	6·1
Greatest dryness	20

Thermometer.

Mean temperature	38
Highest .	53
Lowest .	21

Radiation.

Mean great. of Sun	10·1
Greatest power	36
Mean cold of terrest.	4·7
Greatest ditto	10

	Ins.
Mean qty. of rain	0·746
Mean of evap.	0·73

Table of the Winds.

	Days.	Dew-P.
N. .	1¼	30°
N.E. .	4¾	29
E. .	2½	32
S.E. .	2¾	34·5
S. .	2¼	37·5
S.W. .	5	39·5
W. .	5½	39
N.W. . .	3¾	34

SUNDAY LESSONS.

Feb.	Morning.	Evening.
2	4 Sun.aft.Epiph. Isa. 57.	Mark 2
9	5 „ „ 59.	„ 9
16	Septuages. Sun. Gen. 1	„ 16
23	Sexagesima Sun. „ 3	Luke 6
Feb. 2		Isaiah 58...1 Cor. 14
„ 9		„ 64...2 Cor. 5
„ 16		Gen. 2... „ 12
„ 23		„ 6...Galat. 6

THE MOON'S CHANGES.

New . . . 3rd day, 1h. 59m. aft.
First Quart. 10th day, 4h. 4m. aft.
Full . . . 17th day, 1h. 53m. aft.
Last Quart. 25th day, 10h. 51m. mn.

Day of Mth.	Length of Day.	Day's increase	Day break.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	
1	9 4	1 19	5 44	6 45	16′ 15″
6	9 21	1 36	5 37	6 52	16 14
11	9 39	1 54	5 30	7 1	16 13
16	9 58	2 13	5 21	7 10	16 12
21	10 16	2 31	5 13	7 16	16 11
26	10 36	2 51	5 3	7 24	16 10

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WINCHESTER COLLEGE AND ITS LIBRARY.

[The view exhibits the Cloisters, the entrance to the Library, and the tower of the Church.]

If antiquity has any influence in warming the imaginations of the young, making them feel that the ground upon which they tread is classic, and has been the abode of the learned for ages and centuries, there is no question that St. Mary's College, not unfrequently styled, from its great renovator, Wykeham's College, at Winchester, has a prior claim, in this respect, to any other seminary of learning in the British dominions. The Romans, there is no doubt, formed here an establishment for education in their own literature and religion, and it is said to have occupied the site of the present College. Under the Saxons, Winchester, though probably without an actual College, was still celebrated as a place for instruction. Ethelwald selected Swithin (St. Swithin), bishop of Winchester, as tutor for his favourite son Alfred, who afterwards became so celebrated as a monarch, and attained no mean name among the literati of the time. This is one source of pride to a young Wykehamist even at the present time, and it is a noble pride leading to patriotism, that he treads the same ground and receives his early education where the best and greatest of the Anglo-Saxon kings, the founder of the British navy, received the rudiments of instruction in his infant years.

After Alfred had finally routed the Danes, and onward during the reigns of all the Anglo-Saxon kings down to the reign of Ethelred, whose imbecility again gave boldness to these northern invaders, the school at Winchester appears to have gone on with its usual success; and, at or before this time, sacred architecture, a talent for which first brought Wykeham into notice, appears to have been cultivated with no ordinary assiduity. One of the most conspicuous scholars that it furnished during the tenth century appears to have been Ethelwald, who was first a monk in Winchester, then abbot of Glastonbury, and ultimately bishop of Winchester. He was a native of this city, and appears to have received the whole of his education at its school, and he afterwards became celebrated for architecture, and for various branches of what now would be termed civil engineering. At the command of King Edred and his

mother Elgiva, he planned and superintended the building of the monastery of Abingdon; and his talents were called into requisition at the cathedrals of Ely and Peterborough, and at sacred buildings at various other places. He also rebuilt the cathedral of Winchester; the crypts which remain under the eastern part of the building are understood to be from his designs and executed under his superintendence; and they are among the most perfect and best preserved specimens of the higher class of sacred architecture among the Anglo-Saxons which are to be met with in England. He is also understood to have contrived and executed the division of the single stream of the Itchen into a number of channels, by which means streams of the purest water were brought along many of the streets, and the inhabitants abundantly supplied with that very essential article. The conduct of this Anglo-Saxon prelate is of some importance, as throwing light upon at least some of the studies which were pursued in its schools, which in those days appear always to have been attached to cathedrals and wealthy monasteries, and of which the teachers appear to have been invariably churchmen. That sacred architecture should have been taught in such establishments is what we might naturally suppose; but when we find a student of the school at Winchester projecting, planning, and carrying into effect a means of supplying the inhabitants of the city generally with water, the bent and purpose of some of the studies at least assume a more high and valuable character than many are apt to suppose; for it lets us see that the schools of those times were at least as forward in proportion to the spirit of the age as those of the present day.

Notwithstanding the Danish conquest, if conquest it could be called, the disturbances of the kingdom toward the close of the Saxon dynasty, and the rather questionable sanctity of some of the prelates, there was no falling off when William of Normandy acquired the English crown; and the accession of that monarch, which is known to have given a great impulse to learning all over the country, must have had fully as much influence at Winchester as anywhere else. It was probably owing to the spirit for education which the Norman princes were so anxious to introduce, that the character of the school at Winchester appears to have undergone a considerable change, by being made a general grammar-school for all classes of the people, poor as well as rich. Of this we have evidence in the fact, that when Henry de Blois founded the hospital of St. Cross, just sixty-six years after the Conquest, he directed that, of the hundred poor men who were to be furnished with dinner every day at that institution, thirteen should be "of the poorer scholars of the Great Grammar-school in Winchester, to be selected by the masters."

This statute by De Blois, in the establishment of his hospital, was made 243 years before Wykeham took the grammar-school under his immediate protection, and 257 years previous to the completion of the building for the establishment as new modelled by him. Down to the time when he purchased the grounds of the prior and convent of the cathedral, which answered in Catholic times to what are now the dean and chapter, it does not appear that the school was endowed with any property; and as little does it appear that there was any provision for the master until Wykeham took the management of the school in 1373. It appears to have been part and parcel of the general property and establishment of the prior and convent; though the above-mentioned fact shows that it was directed to other than monastic purposes, and that, in all probability, it fluctuated a little, along with the varying dispositions of those who, for the time, had the management there. But as we may presume that the majority of the monks belonging to this priory were educated at this school, it is natural to suppose that they would display considerable zeal in keeping up the character of a seminary in which their own honour and pride were not a little concerned.

We shall suppose, and indeed it is not supposition but well authenticated fact, that William of Wykeham was among the last of the very illustrious scholars who received their early education in "The Great Grammar-school in Winchester." It reflects the more honour on Wykeham that he was of humble parentage. It has sometimes been said that his original name was not Wykeham, but that his father was John Lang, and his mother Sibil, both of them little above the class of labourers, and that he called himself after the place of his birth, after he had got so advanced in the world as to honour it by so doing. That such was the station of life of his parents there is no reason to doubt; but that he should have changed his name is not in accordance with the character of the man. Be that as it may, his intelligence and superior manners attracted the attention of Nicholas Uvedale, lord of the manor, who sent him to the school at Winchester, and, after he had completed the course of study there for six years, to the College at Oxford. It is probably from the circumstance of his juvenile manners having attracted the attention and patronage of this gentleman, and thus laid the foundation of his future greatness, that Wykeham chose for his motto the adage, "*Manners makyth man.*"*

It does not appear that in the early part of his life Wykeham was in any way intended for the church. But after he had been the six years at Oxford, Uvedale, his patron, who had become constable of Winchester Castle, sent for him to act as his secretary. While he was in this capacity, William of Edington, bishop of Winchester, and treasurer and chancellor to Edward III., saw and admired the ingenuity of young Wykeham. While Wykeham was in the service of the bishop, King Edward visited Winchester, and having been informed of the talents of the young architect, appointed him by patent surveyor of the royal buildings, in which capacity he had charge of castles at Dover, Queenborough, Windsor, and other places, and at Windsor in particular, there is one tower—the same which was occupied by Sir Jeffery Wyatville, while conducting the last renovation of the castle—which is called Wykeham tower.

After various changes of fortune, all of them steps of advancement, Wykeham became bishop of Winchester on the demise of his former patron Edington. This happened in the year 1366; and seven years after this, in 1373, Wykeham took the grammar-school into his own hands, chose Robert de Herton for master, paid the master's salary out of his own private funds, and also found board and lodging for the scholars in different houses in St. John's parish. It was well however for the future existence of this most antient seminary of learning, that Wykeham took this first step of purchasing the management, and fourteen years afterwards, after he had had experience of this, followed it up by also purchasing the ground, erecting new buildings, and endowing the foundation with estates that have ever since made it perfectly independent. Had Wykeham not done this, and had the "great grammar-school" remained an appendage to the cathedral priory, there is not the least question that when Henry VIII. saw fit to seize the properties of the monasteries for his own gratification and that of his courtiers, the "great grammar-school" of Winchester, at which so many eminent men of modern times have received their education, would have gone to oblivion along with many other monastic schools of which not even the names now remain.

The object of Wykeham in the purchase, new modelling, and endowment of this school, must be allowed to have been a laudable one. He had just endowed at Ox-

* This expression is not ungrammatical. *Manners*, *riches*, *goods*, were used as singular nouns in much later times, and with strict reference to their etymology.

ford, the other place of his education, a College for the special benefit of his diocese; and he wished that natives of the diocese, especially those of the city in which the diocesan cathedral was situated, should have the means of obtaining that preliminary education which should qualify them for deriving the necessary advantage from the College at Oxford; and therefore he established the Winchester school, where a certain number of young men should receive board and education gratis, but without excluding others who were willing and could afford to pay. The last however formed no part of the regular establishment, and at present they are not under the direction of the warden of the College, but that of the head master.

[To be continued.]

MEANS OF PERSONAL AND EPISTOLARY INTERCOURSE SEVENTY YEARS AGO.

The history of the post-office is, in many respects, the history of civilization. It cannot, for instance, have any existence until persons are at liberty to go where they please; and it cannot become a truly national establishment until the great body of the people are taught the rudiments of common learning.

In the Anglo-Saxon times, large numbers of our ancestors were as much fixed to the soil as the trees that were planted on it. Even towards the close of the fourteenth century, when the commons were rising in social importance, it was ordained by statute that "no servant or labourer, be he man or woman, shall depart at the end of his term out of the hundred where he is dwelling, to serve or dwell elsewhere." Three centuries afterwards, when the serfs of former times had become free men, the same system of coercion was applied to paupers and destitute persons. They were forbidden to seek employment out of their respective parishes; and this prohibition, which was enforced by pains and penalties, continued in full operation for one hundred and thirty-three years, when it was somewhat relaxed. But it is only within the last five years that the restraint has been wholly removed, and the disposition which it created in the minds of many of the labouring classes will for some time to come exercise its influence upon their habits.

When people live and die without removing from the place where they were born,—when their kindred and connections are scarcely more than a few miles remote,—when the longest journeys extend only to the nearest town, the intercourse of society is evidently not of such a nature as to need such an institution as the post-office, even if people had acquired the art of reading and writing. When persons of rank began to feel the want of a general medium of communication, their correspondence was forwarded by their own special messengers. The establishment of the post-office arose out of the increased activity of epistolary intercourse; and the period when such an institution was required does not date earlier than the sixteenth century.

In the present day, the necessity of a frequent and rapid communication by post is an imperious want. England is no longer exclusively an agricultural country. Thousands leave their father's house at an early age, and pass their lives at a distance from their family connections. A stream of immigration is constantly pouring into England from Ireland and Scotland. In one year, above a hundred thousand persons have emigrated to the British colonies or to the United States of America. The influence of the law of settlement is greatly diminished, and men of the humblest ranks look round to discover how they shall best advance their interests, and no longer despair because the narrow bounds of their native parish do not afford them employment. The excavators employed in the formation of a railway will talk of going to Belgium or some other part of the Continent when they have completed their present contract; and the agricultural labourer, with his scythe at his back, may be seen on board a steam-boat in the Thames, bound for Yorkshire; the low fare of half-a-crown enabling him, after having worked at the most profitable description of agricultural labour as long as it could be obtained in the southern counties, to proceed to the opposite extremity of England in search of similar employment. Upon persons of this class, who are frequently absent from their families for several weeks, the penny post will confer great obligations when they shall have learned to avail themselves of it. Objections may be made to these migrations, but if employment is not to be obtained at home, it is better to go even to some distance, where it is to be had, than be dependent upon the parish. The migration of labourers was permitted by the law passed in 1351, called the 'Statute of Labourers.' Those who resided in the upland districts, where the harvest was late, were allowed to leave their hundred and assist in getting in the harvest in the plains, where it was ready for the sickle much earlier.

Seventy years ago, a young man who came up from Cumberland or Northumberland to make his fortune in London would perhaps not visit the scene of his early life until years had elapsed, and the love of friends, if not of kindred, had become dimmed. Travelling was not only expensive, but the fatigue and loss of time consequent upon a long journey were serious obstacles to locomotion. That frequency of personal intercourse which multiplies the occasions for epistolary communication did not exist to anything like the extent which is possible at this day. By the railroad, a man can now leave London at half-past eight at night, and at seven in the morning he may breakfast at Preston, 221 miles from the metropolis. The motion of the railway train is so easy that there is nothing to prevent a traveller sleeping through the night. There is not any one of the remarkable improvements of the last thirty years which would have astonished men of the last generation so much as this marvellous fact. The unrivalled perfection to which travelling by mail and stage coaches was carried before railroads were formed would have scarcely appeared less miraculous. Our grandfathers thought they were "going a-head" at the time when the following announcement was made in a work published in 1768:*—"There is of late an admirable commodiousness both for men and women of better quality to travel from London to almost any town of England, and to almost all the villages near this great city, and that is by stage-coaches, wherein we may be transported to any place, sheltered from foul weather and foul ways; and this not only at a low price, at about a shilling for every five miles, but with such speed as that the posts in some foreign countries make not more miles in a day; for the stage-coaches, called 'flying-coaches,' make fifty or sixty miles in a day, as from London to Oxford or Cambridge; sometimes seventy, eighty, or a hundred miles, as to Southampton, Bury, and Norwich."

Our grandfathers moreover were content if the post conveyed their correspondence to and from London twice or thrice a-week; but now, by the recent establishment of morning mails, letters are sent to most parts of the country twice a-day, or twelve times a-week. Thus, a letter from Brighton, addressed to a person in Yorkshire, is not delayed fourteen hours in London, but is hurried on to its destination two or three hours after it reaches the General Post-office. A merchant at Liverpool also receives the letters which arrive every morning in London by the foreign mails without that injurious delay which took place only two years ago. The change necessarily arose out of the accelerated speed of railway conveyance, which rendered delays formerly little thought of appear monstrous. When the mail-coach was twenty-four hours in travelling from London to Liverpool, a delay of fifteen hours in London was but little more than one-half the

* 'Magnæ Brit. Notitiæ.'

time occupied by the journey; but when the same distance came to be performed in about nine hours, then the disproportion appeared so great as to require an immediate alteration; and therefore letters, instead of lying in the General Post-office all day, are despatched by the morning mails, and reach places above two hundred miles distant from London before the hour at which they would formerly have been sent off by the night mails. The morning mails are of course available to as well as from London.

Seventy years ago, as we have already stated, the communication by post with the principal towns of England was only twice or three times a-week, and with many places not so frequently. Saturday was the great post-day, mails being on that day made up for all parts of England, Scotland, and Ireland; but "the post goes every day to those places where the court resides, as also to the several stations and rendezvous of His Majesty's fleet, as the Downs and Spithead; and to Tunbridge during the season for drinking the waters."* The post-office has now become the most democratic of all our public establishments. It admits all on the most perfect equality; and even the sovereign abandons the privileges of the royal prerogative, and is on a level with the subject. In the olden time, if we may apply that term to a period almost within the recollection of old persons, the post went out daily to the place where the fashionables of the last century were accustomed to resort; while to Manchester, Liverpool, Leeds, Birmingham, and all our great cities, three times a-week was considered sufficiently frequent. Let the reader imagine, if possible, that these towns in the present day had only a post-office communication with London thrice a-week instead of twice a-day, and that Bath and Tunbridge had their daily post; and it will be felt how great are the changes which have taken place in our social and commercial intercourse since the commencement of the reign of George III. The account from which we quote says:—"Letters are received from all parts of England and Scotland (except Wales) every Monday, Wednesday, and Friday; from Wales every Monday and Friday; and from Kent and the Downs every day." Packets *sailed* twice a-week for France, that is, about as frequently as they now start for America. The 'Great Western,' 'Liverpool,' or 'British Queen,' 'steaming' across the Atlantic in less than a fortnight, would have been as marvellous to the men of 1768 as the railroads. Nevertheless, in that day and generation the arrangements of the post-office were regarded with the utmost complacency. "Letters are conveyed in so short a time, by night as well as by day, that every twenty-four hours the post goes 120 miles; and in five or six days an answer to a letter may be had from a place 300 miles distant from London." At present it is quite possible for a person living at Preston, 221 miles from London, to send a letter to and receive an answer from London in twenty-five hours, allowing too a delay of four hours in London, the distance traversed being 442 miles. In 1768, the mail, travelling at the rate of less than six miles an hour, would have been little more than half-way to Preston in the same time. It is also quite possible, in a case of emergency, for a merchant at Birmingham to write to his correspondent at Liverpool in the afternoon and receive a communication in reply the *same night*, the distance, which is above two hundred miles, being traversed between half-past two and a quarter before twelve, and an hour being allowed at Liverpool.

It is estimated that the number of letters conveyed through the post-offices of England and Wales in a year was about sixty millions, previous to the recent change in the scale of postage; and perhaps the number will very soon exceed two hundred millions, an enormous amount of correspondence, it must be confessed. But when every man and woman in England can write instead of only about one-half of the adult population, even this number will probably be small in comparison with the frequent use which will then be made of the post. But the generation preceding our own conceived that in their time the activity of correspondence by the post had attained a magnitude which would have surprised *their* grandfathers. "Though (says the writer of 1768) the number of letters missive were not at all considerable in our ancestors' days, yet it is now so prodigiously great (since the meanest people have generally learnt to write*), that this revenue amounts to about 110,000*l.* a-year." The postage was at that time 3*d.* for 80 miles, and for distances above 80 miles the charge was 4*d.* Supposing that the average of all letters posted was 3½*d.*, it would appear that the number of letters annually transmitted by the post, not in England and Wales only, but in Great Britain, was 7,500,000. The population has trebled since this period, but we hope soon to see the correspondence by letters increased forty or fifty fold.

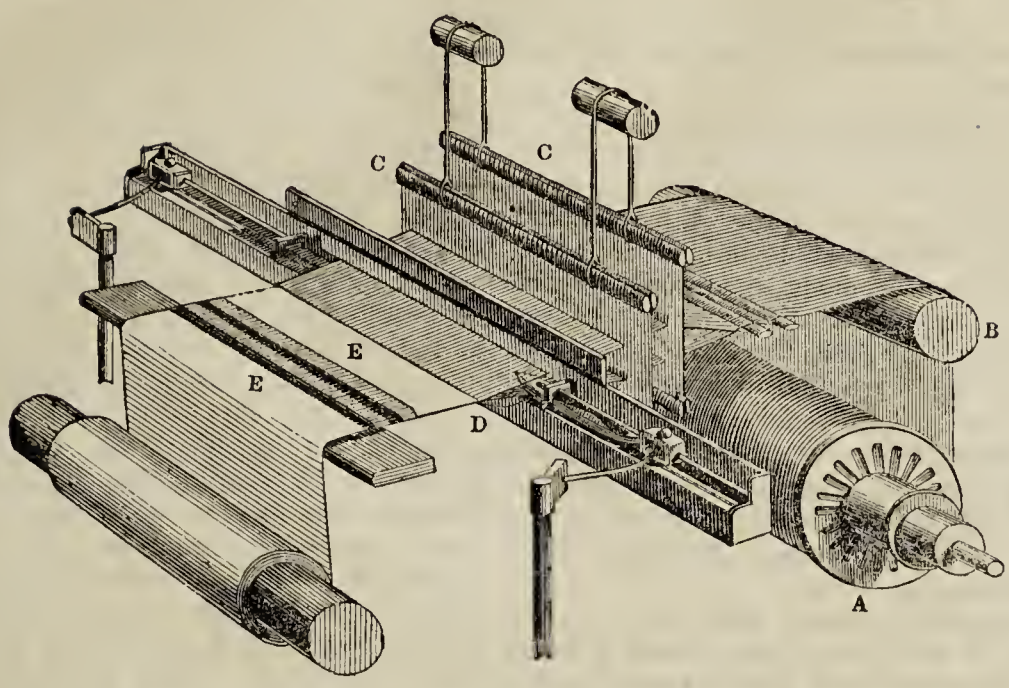
* 'Magnæ Brit. Notitiæ.'

The Rook.—I have spoken of the conjugal affection of the rook. The female takes possession of the nest the moment the building of it commences, and she is attended upon and fed by the male, and with a fondling tremulous voice and fluttering wings, and with more little blandishments than one would think such a bird was capable of expressing, she receives the food which he brings to her; by-and-bye the young are hatched, and perhaps the latter part of the spring is dry, and grubs and wire-worms, and earth-worms, and all the enemies of the farmer—on which, and not on his corn, the rook subsists—are deep in the earth, and beyond his reach; then at the first dawn of light he is seeking the dew-worms, and during the day perambulating the fields and wandering by the side of the hedges and remaining out searching for food quite in the dark, and returning to his roost long after the usual period for retiring, and having fed his brood, himself exhausted and starved, falling from the nest dead under the trees, and others, the only birds with regard to which we have proved this, taking to the broods, and feeding them as well as they can. This bird, with all his interesting qualities, is also a useful one, one of the farmer's best friends. Some corn-seeds, but not many, are occasionally found in his craw; the newly planted potatoes suffer to a certain degree, in his eagerness to get at the grubs with which they are infested. That the food of this bird is the insect, and not the corn, may be easily ascertained. Go into the field in which the ploughman and the sower are both at work, plenty of rooks will generally be found there, but it is the ploughman on whom they attend, and not one particle of the seed is stolen. Time passes on, and the young rooks begin to be able to sit upon the edge of their nests, and they soon wander to the neighbouring boughs, and then a parcel of cowardly fellows congregate together under the trees and shoot as many of them as they can, while the poor old birds are darting about and expressing their grief and soliciting mercy. True, the young rooks are said to be destroyed for food; a portion of them are thus used, but that is not the object of the sportsman, it is murder on the greatest scale on which he can effect it—the murder of one of the most useful birds that our country contains, and that murder committed in view of the parent, and at the period at which the parental affection is most intense.—*Humanity to Brutes, by W. Youatt.*

The 'Naras, a New Fruit.—The 'naras was growing on little knolls of sand; the bushes were about four or five feet high, without leaves, and with opposite thorns on the light and dark green striped branches. The fruit has a coreaceous rind, rough with prickles, is twice the size of an orange, or fifteen or eighteen inches in circumference, and inside it resembles a melon as to seed and to pulp. I seized a half-ripe one and sucked it eagerly for the moisture it contained; but it burned my tongue and palate exceedingly, which does not happen when this most valuable fruit is ripe—it has then a luscious subacid taste. Some plants of 'naras are now growing in England (March, 1838), from seeds which I brought home: they are a foot high and beginning to branch, having two thorns at each articulation, and a stipule scarcely to be called a leaf between them, on the axis of which is a bud, but no leaves.—*Alexander's Expedition of Discovery.*

* This was, unfortunately, an exaggeration.

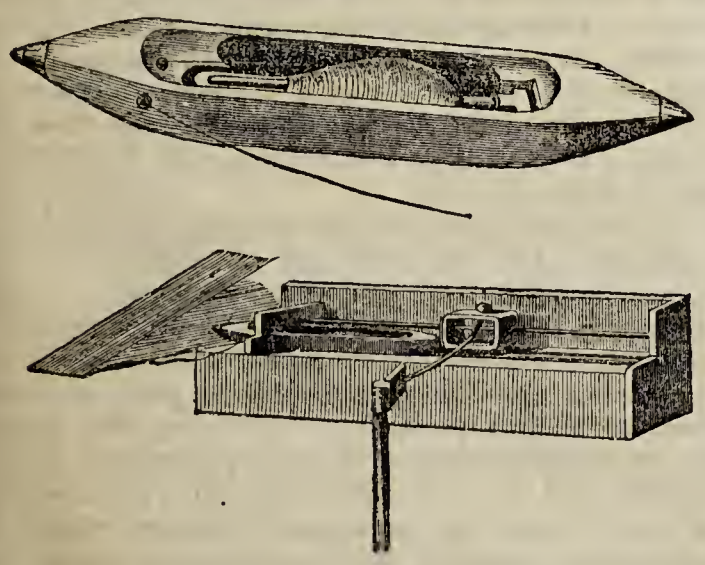
HISTORY OF A COTTON GOWN.—No. III.



[Power-loom.]

Instead of endeavouring to explain all the complexities of a modern loom, we will confine ourselves to that part immediately connected with the throwing of the shuttle. A is a roller round which the parallel threads of warp are wound; these threads pass over another roller B, and pass through the vertical threads of two upright frames C C, called *treddles*. These treddles have the effect of separating the warp into two parcels, one of which is depressed while the other is elevated; the adjoining threads of the warp being alternately depressed and elevated. When the threads advance to the point D, just before they reassemble into one parallel layer, a shuttle (the point of which is just seen under the upper threads) is suddenly driven across from edge to edge of the warp, carrying with it *one thread of weft*, which becomes thus interlaced among the threads of the warp. A piece of mechanism called a *batten* then presses that thread of weft close up to those before made, and which form the completed portion of woven cloth E E. By reversing the motion of the treddles and of the shuttle, another thread of weft is formed in a similar manner, and so on continuously.

The shuttle is a kind of little boat, containing yarn



[Shuttle of Power-loom.]

wound on a spindle. As the shuttle moves onward the spindle revolves and unwinds the yarn, which passes out through a little hole in the boat. The lower half of the adjoining cut shows the mechanism by which the shuttle is driven between the divided threads of the warp.

In making calico, the shuttle of a power-loom generally travels to and fro across the warp about one hundred and twenty times per minute, thus making an equal number of threads of weft in the same time, and a complicated series of movements takes place between each two movements of the shuttle, having for their object to drive up the thread of weft to the cloth already woven, and to reverse the position of the divided parcels of warp, elevating those which were before depressed, and *vice versâ*.

If we examine a piece of calico or of muslin, or the material for a printed cotton gown, we perceive that the threads pass regularly over and under one another, that is, that the cross threads never pass over or under two *adjoining* threads of warp. But if we look at those fabrics which are called *twills*, we perceive a peculiar oblique ribbed appearance; this is caused by a deviation from the mode of weaving just spoken of; after passing under one thread of warp, the weft passes over two, three, four, or even as many as eight adjoining threads, which of necessity imparts a peculiar texture to the fabric. This is one of the means by which the manufacturer multiplies the variety of his goods; for many of the articles which obtain different names at our mercer's and linen-draper's, only differ from each other in the number of threads of warp that the weft passes over after having passed under one thread. In other cases these differences are combined with some peculiarities in the kind or quantity of cotton yarn employed; thus damask, dimity, diaper, fustian, jean, velveteen, corduroy, &c. are all *twills*, and are (some always, others occasionallly) made of cotton. The first three are woven in such a peculiar way, that the twill is made to form a *device* or *pattern*, instead of merely forming a ribbed appearance obliquely across the cloth; the weft, after passing under one thread, goes over from three to seven, according to circumstances, and the opening between the two divisions or parcels of warp is so managed as to lead to the production of a pattern, often very elaborate. The other fabrics we have mentioned are cotton twills, made of stout materials, and having a kind of nap or pile on the surface; this pile is produced by working up and sometimes cutting the loose glossy fibres of the cotton after the weaving is completed.

But these details respecting cotton fabrics generally, however interesting, would lead us to too great a length. We must confine ourselves to our cotton gown. The processes hitherto considered have led to the production of a piece of cloth, of a dirty white colour, and devoid of any pattern whatever. If warmth and comfort were the only

objects sought for in clothing, the services of the dress-maker might now immediately succeed those of the manufacturer. But such are not and never have been the limits in this respect; richness of colour and beauty of device have been objects of admiration in every age and country; and the cotton-manufacturer has not neglected to appeal to this taste.

One mode of producing both colour and pattern in woven cloth is to have the threads of the warp of two or more different colours; thus, ten threads white, then ten black, and so on throughout the two or three thousand threads that generally constitute the width of a piece of cloth; a white weft woven in among these would produce a black and white *striped* cotton. If the weft were of two colours, and the warp only one, the stripes would be *across* the cloth. If both warp and weft were variously coloured, a *checquered* pattern would be produced. It will be easy to conceive, from these three instances, how great variety of pattern might be produced when the colours, both of warp and weft, are more than two, and when changes are made in the number of threads which compose each alternation of colour.

But such a plan cannot, without a complexity of weaving apparatus that would lead to costly results, produce *flowers*, *foliage*, *scroll-work*, and similar small patterns. The object of manufacturers, therefore, was to devise the means of laying on a kind of paint or dye, which should impart to white cotton cloth any desirable pattern: if this pattern were only impressed on one side, the inconvenience would not be great, for most garments are seen but on one side. In 1676 a rude mode of impressing patterns on woven cloth was introduced into England from India. Upon this method successive improvements were made, until at length the art has been brought to great excellence. We cannot enter into the extensive subject of *dyeing*, by which a uniform colour is impregnated entirely through the fibres of woven cloth; suffice it to say, that cotton fabrics, like those of wool, &c., are dyed by being dipped into large vats containing colouring liquids.

Let us suppose that the piece of cotton which has engaged our attention, instead of being dyed one uniform colour, is to have a pattern printed on it. The first operation is to *singe* or burn off the loose downy fibres, which would considerably injure the appearance of the cloth if allowed to remain. This singeing is usually effected by passing the cloth with uniform velocity over a very hot iron: the fibres are burned off, but the movement is too quick to allow the cloth to be injured. The cloth is then *bleached* or whitened, for it must be remembered that the natural colour of the fibres, and the many processes they have to go through, impart to cotton cloth a yellowish cast, which is exemplified by the unbleached cotton occasionally received from India: the snowy whiteness of muslins and calicoes is considered an indispensable feature in them; and it is also deemed desirable in cotton about to be printed. The *Bleaching* in our first-rate establishments consists of no fewer than twenty-five distinct processes, and yet a yard of cotton can be bleached for less than one half-penny. But the part of these processes which is the more particularly connected with the removal of colour is that in which *bleaching powder* (chloride of lime) is dissolved in water, and applied to the cloth. One of the constituents of the powder is *chlorine*, a gas possessing the remarkable property of removing colour from almost every class of material, animal, vegetable, or mineral.

Cotton bleaching is the work of one class of persons, cotton or calico printing of another; the cotton to be printed has therefore to pass from the former to the latter. The colours which may be given to the cloth are of infinite variety, and are produced by various substances, such as cochineal, madder, Brazil wood, indigo, Prussian blue, Scheele's green, Saxon green, &c. In elucidation of the manner in which these colours are stamped on the cloth, we may say a word or two respecting *wood-cut* and *copper-plate* printing. *Wood-cuts*, such as those illustrating this article, are printed from wood-blocks on which the figure has been cut, those parts which represent the device being left prominent:—ink is spread on these prominent parts, and an impression obtained from them. But in *copper-plates* the device is *engraved*, that is, the lines which are to form the device are sunk instead of being left prominent; ink is spread over the whole plate, wiped off again from the level surface, and left in the engraved depressions, which impart the device to the paper. Now these processes almost exactly resemble the old and the new methods of calico-printing. According to the old plan, the device was cut upon a block of sycamore, the parts which were to make the impression being left prominent, but when the figure was very fine and complicated, the device was made of small pieces of copper, which were ingeniously driven into the block, and the interstices filled up with felt. In the more modern mode, the device is engraved on a plate or on a cylinder of copper. In the former of the two instances, the flat copper-plate is about a yard square, and after the colour has been applied to its surface, an elastic steel plate is made to pass over it, and remove all the colour from the surface. In the second instance the device is engraved on the surface of a large copper cylinder; and after the colouring and partial removal of colour, the rotation of the cylinder impresses the device upon the cloth, as the latter moves through under the cylinder.

Most of the colours will not remain permanent on the cloth unless the latter be previously dipped into some liquor of a binding quality; such a liquor is called a *mordant*, of which the principal is a solution of alum. This circumstance enables cottons to be printed in several ways. Sometimes the device is printed with an ink (if we may use the term) which is a mordant, and the cloth is then dyed or steeped in some particular colour: on washing the cloth, the whole of the colour washes out, *except* that part where the mordant had been used. In other cases a colouring substance is used, which has the property of uniting with the cloth without the aid of a mordant, but it is prevented from so uniting at some parts by printing a device with some peculiar substance called a *resist paste;* after printing with this resist paste, and then dyeing the whole piece of cotton, washing will remove the dye from those parts touched by the resist paste, but not from the other parts. It is obvious that a *pattern* is produced by both these means, but in a precisely opposite way. The former of the two methods produces a coloured pattern on a white ground; the latter a white pattern on a coloured ground. In either case, however, by a judicious choice of colours, of mordants, and of resist pastes, the whole extent of the cloth may be made to receive various colours, with no portion of white remaining visible.

We will briefly illustrate these remarks by speaking of a blue and white, and a red and white cotton. For the former the device is printed in a resist paste of sulphate of copper; the cloth is then dipped in a blue dye of indigo, and, after some other processes, washed; this washing removes the blue from the printed parts, and leaves them white, thus producing a blue and white pattern. In the second instance the device is printed with an alum mordant, and the piece is then dipped in a dye of *madder* or some similar red: subsequent washing removes the red from all those parts which have *not* been printed with the mordant, and thus a red and white pattern is produced. In the Bandanna cotton handkerchiefs, designed to imitate silk, the cloth is dyed of one uniform colour, and a device of spots formed by removing part of the colour, through a very peculiar application of chlorine, quite different from the process of calico-printing.

We have now manufactured the material for our cotton

gown, by tracing its progress from the state of a woolly fibre, to that of an ornamentally-coloured woven fabric from which garments may be made. The number of processes, the ingenuity employed, the amount of capital invested, the number of workmen, and the impulse given to the export trade of England, render the cotton manufacture of an importance quite unexampled in any other kind of manufacture at home or abroad. Were there not official evidence in support of the fact, it would perhaps be thought incredible that the value of our exports of manufactured cotton equals that of all *our other exports put together:* it is said now to amount to more than twenty-two millions sterling annually. As to the importance of the cotton manufacture in a *social* point of view, we would direct the reader's attention to the following judicious remarks from Mr. Baines:—"If the thought should cross any mind that, after all, the so-much-vaunted genius of our mechanics has been expended in the insignificant object of enabling men better to pick out, arrange, and twist together the fibres of a vegetable wool—that it is for the performance of this minute operation that so many energies have been exhausted, so much capital employed, and such stupendous structures raised, and so vast a population trained up, we reply, our object is not insignificant because the operation by which it is effected is minute. The first want of men in this life, after food, is clothing, and as *this* art enables them to supply it far more easily and cheaply than the old method of manufacturing, and to bring cloths of great elegance and durability within the use of the humble classes, it is an art whose utility is inferior only to that of agriculture. . . . . By supplying one of the great wants of life with a much less expenditure of labour than was formerly needed, it sets at liberty a larger proportion of the population to cultivate literature, sciences, and the fine arts. To this country the new inventions have brought a material accession of wealth and power."

SILK-PRODUCING FISH.

In a previous number of the 'Penny Magazine' (vol. vii., p. 143) details have been given respecting the production of silk by the silk-worm, and of substances closely resembling silk by other insects. A slight allusion was at the same time made to a fish called the *Pinna*, which also produced a kind of silk. The costliness of this latter material has prevented it from attaining a commercial importance, but the circumstances connected with its production are highly deserving of a notice more extended than was compatible with that article.

The pinna belongs to the same order of shell-fish as the well-known muscle, but is very much larger, sometimes attaining so great a length as two feet. The fish is furnished with an organ which serves various purposes at different times. When the animal is about to change place (which is but seldom), the extremity of this organ, which then acts as a leg, is fixed to some solid body, and being then contracted in its length, the whole fish is drawn towards the spot where the end of the organ has been fixed; these movements repeated as often as may be necessary, the animal succeeds in changing its place.

But the more frequent employment of this organ is as a sort of *tongue*, by which the fish spins, or rather moulds, a beautifully fine fibrous substance. The manner in which it acts, according to a late writer on the silk-manufacture, is as follows:—Although the tongue is flat, and somewhat similar in form to a human tongue through the greater part of its length, it becomes cylindrical near the base or root, where it is much smaller than in any other part; at this lower end are several ligatures of a muscular nature, which hold the tongue firmly fixed against the middle of the shell; four of these cords are very apparent, and serve to move the tongue in any direction, according to the wants of the fish. Through the entire length of this tongue there runs a slit, which pierces very deeply into its substance, so as almost to divide it into two longitudinal sections; this slit performs the office of a canal for the liquor of which the threads are formed, and serves to mould them into their proper form; this canal appears externally like a small crack, being almost covered by the flesh from either side, but internally it is much wider, and is surrounded by circular fibres. The channel thus formed extends regularly from the tip to the base of the tongue, where it partakes of the form of the tongue, and becomes cylindrical, forming there a close tube or pipe, in which the canal terminates. The viscid substance is moulded in this tube into the form of a cord, similar to the threads produced from it, but much thicker, and from this tube all the minute fibres issue and disperse. The internal surface of the tube in which the large cord is formed is furnished with glands for the secretion of the peculiar liquor employed in its production, and which liquor is always in great abundance in this muscle.

The *pinnæ* live on the shores of the Mediterranean, usually on sandy banks five or six toises below the level of the sea. They support themselves and their shells in a vertical position, by means of the silken fibres which are protruded in the manner just described. These fibres, called collectively the *byssus*, they attach to any surrounding bodies, or even to grains of sand, in a manner sufficiently firm to enable them to resist the motion of the sea, for they are ill-content with locomotion.

The common edible muscle has the power of producing filaments in a similar way. That they affix themselves to rocks has been long known; but it was not till Reaumur investigated the subject, that it was found how this fixation was attained. He put some muscles into a vessel containing sea-water, and watched their progress. They opened their shells and protruded an organ which we may call a tongue, and moved it about in various directions, as if to find a place whereon to fix itself. After some time one of them was observed to attach the tongue to a particular place, and on drawing it away again with some quickness, Reaumur perceived a very fine thread adhering to the vessel; this, once begun, was repeated several times, until a cluster of fibres was produced. Reaumur afterwards found, that on tearing a muscle away from a rock to which it is attached, it will, if left to itself, speedily repair the damage by spinning some more fibres.

The fibres produced by the muscle are manifestly too short to be woven into a useful fabric; but it appears that the byssus of the larger pinna was early employed for this purpose, as a costly and rare ornament. The word *byssus* is frequently employed in early writings, and it has been supported by some that it was the byssus of the pinna alluded to. It is said that a robe composed of byssus of the pinna was presented to the satraps of Armenia by one of the Roman emperors.

But be this as it may, it is certain that the byssus of the pinna has been employed by the Sicilians for a long time as a material for light clothing. It existed among them more than a century ago, and has continued more or less ever since. The Sicilians not only eat the fish, but make use of the byssus. In order to collect the pinnæ they go out in boats, provided with an iron instrument called a *cramp*, with two prongs or teeth about a foot long projecting from it, and with a handle long enough to reach from the boat to the place where the fish is stationed. The instrument is let down, and the prongs placed beneath the shell, so as to catch it between them. By the muscular force of the man (or sometimes of two or three men) the fish is dragged away from its hold of the rock, by a fracture of the filaments of the byssus, at some part of their length. The fishermen then cut close to the shell those fibres which are sufficiently long for spinning, and these, after being combed or carded,

to remove impurities, are spun into yarn or thread, just as silken filaments would be; and from this yarn are woven or knitted garments of various kinds, such as gloves, stockings, caps, and other light articles. As the filaments of byssus are extremely fine, of a perfectly equal diameter throughout their length, and of some strength, it is found that the fabrics woven from them are supple, strong, and warm; in fact, the combination of extreme lightness with warmth seems to mark this substance in an especial degree.

We must now speak of a circumstance connected with the pinna, which has attracted a great deal of notice among the early naturalists. The pinna is said to be destitute of the organs of sight, and therefore but ill prepared to defend itself from hostile attacks when its shell is open. It is also said to have a deadly foe in the cuttle-fish. Lastly, a little fish of the crab kind has been frequently found sheltered in the shell of the pinna. All these circumstances combined gave rise to much speculation among early naturalists, in which truth appears to have been somewhat confounded with fiction. Aristotle spoke of a little fish with claws like a crab, which keeps guard for the pinna, grows to her mouth, and acts as her caterer. Pliny describes the pinna as a shell-fish that is found in muddy waters, always erect, and never without a companion of the crab kind. Oppianus, a Greek poet, celebrated the friendship of the two fishes in a stanza, which has been thus rendered in English:—

> "The pinna and the crab together dwell,
> For mutual succour, in one common shell:
> They both to gain a livelihood combine;
> That takes the prey, when this has given the sign:
> From hence this crab, above his fellows famed,
> By ancient Greeks was Pinnatores named."

Lamarck has represented the ancients, generally speaking, as having entertained the idea that the pinnatore or crab was the natural sentinel, guardian, companion, and caterer of the pinna; that he took birth with him; that he was essential to the pinna's existence; that the pinna, having no eye-sight, and not much energy of sensation generally, opened his shell in order that small fish might enter; and that the crab advertised him, by a gentle bite, that he had a sufficient quantity, and that he should close his shell; and that they both then shared the booty, the crab having brought eye-sight, and the pinna strength of shell, as their respective contributions to the joint-stock partnership.

Let us now come down to more recent times. In 1749, Hasselquist, the distinguished naturalist, made a voyage to the Levant, and wrote to Linnæus on many of the natural objects which engaged his attention. In one of his letters he says: "Amongst others they sell here (Smyrna) a sepia or cuttle-fish, which by them is called οκτωποδια; it has only eight tentacula, all of equal length; the whole animal is a foot long, and thick in proportion. Of this the Greeks have related me an anecdote, which I think remarkable. The Pinna muricata, or great silk muscle, is here found in the bottom of the sea in large quantities, and is a foot long. The cuttle-fish watches the opportunity, when the muscle opens her shell, to creep in it and devour her; but a little crab, which has scarcely any shell, or has at least only a very thin one, lodges constantly in this shell-fish. She pays a good rent, by saving the life of her landlady, for she keeps a constant look out through the aperture of the shell, and on seeing the enemy approach, she begins to stir, when the πινα (for so the Greeks call the shell-fish), shuts up her house, and the rapacious animal is excluded. I saw this shell-fish first at the island of Milo, and found such a little crab in all I opened: I wondered not a little what was her business there; but when I came here I was first informed of it by the secretary of our consul, M. Justi, a curious and ingenious man, who has travelled much, and lived long in this place. This was afterwards confirmed by several Greeks, who daily catch and eat both these animals."

But the researches of more recent naturalists, particularly those of France, have led to doubts as to some part of these statements. Some of the details are, in all probability, due to romance, but a recent writer says that the following is a probable version of the real state of the case:—That whenever the pinna ventures to open its shell, it is immediately exposed to the attacks of various of the smaller kinds of fish, which, finding no resistance to their first assaults, acquire boldness and venture in; that the vigilant guard, by a gentle bite, gives notice of this to his companion, who, upon this hint, closes her shell, and having thus shut them in, makes a prey of those who had come to prey upon her,—sharing the booty with her companion. If this be the case, it is sufficiently curious, without venturing into the field of romance.

With respect to the employment of the pinna as a source whence silk might be produced, many naturalists think it might be greatly extended. M. Bosc (*Dict. des Scien. Nat.*) says: "It would seem, from the knowledge we possess, that the capture of the pinna might be regulated, and the product prodigiously increased. A certain number of pinnæ might be caught, not with the cramp, for that generally wounds them mortally, but by severing their byssus. These pinnæ might be placed in ponds of moderate depth, where persons might go from time to time to cut the filaments. Their numbers, as is common with the bivalves, would rapidly increase, and a considerable revenue might be thereby derived. But it is not from people so little industrious and so ignorant as the Calabrians that we must look for improvements in the arts: it is necessary, before they effect such an object, to conquer prejudices and to have a better form of education."

M. de Blainville also thinks that by keeping the pinnæ in ponds they would multiply greatly, and that they could be collected conveniently and at the proper times for cutting off the byssus.

The Paraguay Tea-tree.—The yerba-maté, or tea, is as much in general use and demand throughout all the provinces of La Plata, Chile, and many parts of Peru, as the teas of China are in Europe. The plant which produces it (the Ilex Paraguayensis) is an evergreen of the holly species, about the size of an orange-tree, which grows wild and in great abundance in the dense forests in the northern and eastern parts of the province, whither the people repair yearly in numerous gangs to collect it. The difficulties of penetrating the woods to reach the 'yerbales,' as they are called, are considerable, but they are amply repaid by the certain profits of the adventure. The whole process of preparing and packing it for market is performed on the spot. The tender branches and twigs, being selected, are roasted quickly over a fire till the leaves are crisp; and then, after being partially crushed or pounded, are rammed into hide bags, called 'serrons,' containing 200 lbs. each, which, when sown up, are ready for sale. The Jesuits cultivated the plant, of which there are three species, in their missions; and by attention produced a better quality of tea, called 'caamini,'* than that from the wild plant collected in the woods. From the practice of reducing the leaf nearly to dust probably originated the general custom in South America of sucking the infusion when made through a tube, at one end of which is a strainer, which prevents the small particles of the tea-leaves from getting into the mouth: it is usually made very strong, very hot, and very sweet with sugar; its properties seem to be much the same as those of the China tea. The Spaniards learned to use it from the Guarani Indians. Before Paraguay ceased to be a province subject to the government of Buenos Ayres, eight million pounds of Paraguay tea were annually sent to Santa Fé and Buenos Ayres.—*Sir Woodbine Parish's Buenos Ayres and the Provinces of the Rio de la Plata.*

* The Indians paid their tribute to the crown in this sort of tea.

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JOHN ELWES, THE MISER.*

[Portrait of John Elwes.—From Topham's 'Life of Elwes.']

THE life of a mere miser can afford so little general instruction and excite so little general interest, that had Mr. Elwes been one of that unhappy class, his biography would, in all probability, so far as Mr. Topham is concerned, have remained unwritten: but Mr. Elwes was not a mere miser; he possessed qualities that might have entitled him to the love and reverence of his friends, and to the respect and admiration of his countrymen, had they but been freely developed: they were, however, during a considerable portion of his life, more or less checked by the unfortunate desire of amassing money, and they may be said to have ultimately disappeared altogether beneath the hateful influence of that all-absorbing passion. "During the lifetime of Mr. Elwes, I said to him more than once, I would write his life. His answer was, 'There is nothing in it, Sir, worth mentioning.' That I have been of a different opinion, my labours will show." Thus speaks Mr. Elwes's biographer in the preface to his very interesting little work, which was at first published in portions in a periodical paper called the 'World,' and received by the public with so much approbation, that the whole was afterwards issued in a collective form, and ran through several editions. As much of the interest of the publication results from the author's close personal intimacy with Mr. Elwes, and from the easy agreeable style of the narration, the following account is given as nearly as possible in Mr. Topham's own words.

The family name of Mr. Elwes was Meggot; and as his Christian name was John, the conjunction of 'Jack Meggot' made strangers sometimes imagine that his intimates were addressing him by an assumed appellation.

* 'The Life of the late John Elwes, Esq.,' member in three successive parliaments for Berkshire, by Edward Topham, Esq., late captain in the second troop of horse-guards, and magistrate for the counties of Essex and York.

His father was a brewer of eminence, who died while Mr. Elwes was only four years old; little of the character of Mr. Elwes was therefore to be attributed to him; but from the mother it may be traced at once; for though she was left nearly one hundred thousand pounds by her husband, she starved herself to death. At an early period the boy was sent to Westminster School, where he remained ten or twelve years. During that time he certainly had not misapplied his talents, for he was a good classical scholar to the last; and it is a circumstance not a little remarkable, though well authenticated, that he never read afterwards. His knowledge of accounts was very trifling, which may in some measure explain the total ignorance he was always in as to his affairs. From Westminster School he removed to Geneva, where he soon entered upon pursuits more agreeable to him than study. The riding-master of the academy there had to boast perhaps three of the best riders in Europe, Mr. Worsley, Mr. Elwes, and Sir Sydney Meadows. Of the three, Elwes was reckoned the most desperate: the young horses were always put into his hands, and he was the rough-rider to the other two. During this period he was introduced to Voltaire, whom he somewhat resembled in point of appearance; but though he has mentioned this circumstance, the genius, the fortune, the character of Voltaire never seemed to strike him—they were out of his contemplation and his way; the horses in the riding-school he remembered much longer, and their respective qualities made a deeper impression on him. On his return to England he was introduced to his uncle, Sir Harvey Elwes, who was then living at Stoke in Suffolk, perhaps the most perfect picture of human penury that ever existed. Mr. Elwes, being at that time in the world, dressed like other people. This would not have done for Sir Harvey: so the nephew used to stop at a little inn at Chelmsford, the expense of which he did not much like, and begin to dress in character;—a pair of small iron buckles, worsted stockings darned, a worn-out old coat, and a tattered waistcoat were put on, and onwards he rode to visit his uncle, who used to contemplate him with a miserable kind of satisfaction, and seemed pleased to find his heir attempting to come up with him in the race of avarice. There they would sit—saving pair!—with a single stick upon the fire, and with one glass of wine occasionally betwixt them, talking of the extravagance of the times; and when evening shut in they would retire to rest, as "going to bed saved candle-light." But the nephew had then, as at all other times, a very extraordinary appetite; and this would have been a monstrous offence in the eyes of the uncle; so Mr. Elwes was obliged to pick up a dinner first with some neighbour in the country, and then return to Sir Harvey with a little diminutive appetite that was quite engaging. I trust, continues Mr. Topham, a small digression to give the picture of Sir Harvey will not be thought unamusing or foreign to the subject. He was, as may be imagined, a most singular character. His seclusion from the world nearly reached that of a hermit; and could the extremity of his avarice have been taken out of the question, a more blameless life was never led. His life shows that a man may at length so effectually retire into himself, that he may remain little else but vegetation in a human shape!

Providence perhaps has wisely ordered it that the possessors of estates should change like the succession of seasons: the day of tillage and the sced-time—the harvest and the consumption of it—in due order follow each other; and, in the scale of events, are all alike necessary. This succession was exemplified in the character of Sir Harvey Elwes, who succeeded to Sir Jervoise, his grandfather, a very worthy gentleman, who had, however, involved, as far as they would go, all the estates. On his death Sir Harvey found himself nominally possessed of some thousands a year, but really with an income of one hundred pounds per annum. He said on his arrival at Stoke, the family seat, "that never would he leave it till he had entirely cleared the paternal estate;" and he lived to do that, and to realise above one hundred thousand pounds in addition. But he was formed of the very materials to make perfect the character of a miser. In his youth he had been given over for a consumption (though, such is the power of temperance, he lived till betwixt eighty and ninety years of age), so he had no constitution and no passion; he was timid, shy, and diffident in the extreme; of a thin spare habit of body, and without a friend upon earth. Next to his greatest delight, the hoarding up and counting over his money, was that of partridge-setting, at which he was so great an adept, and game was then so plentiful, that he has been known to take 500 brace of birds in one season. He lived upon partridges; he and his whole household, consisting of one man and two maids. When the day was not so fine as to tempt him abroad, he would walk backwards and forwards in his old hall to save fire. His clothes cost him nothing, for he took them out of an old chest, where they had lain since the gay days of Sir Jervoise. One evening, after he had retired, some robbers, watching their opportunity, obtained admittance into the house; having previously bound the servants, then going up to Sir Harvey, they presented their pistols and demanded his money. At no part of his life did Sir Harvey behave so well as in this transaction. He would give them no answer till they had assured him that his servant, whom they had left gagged in the stable, and who was a great favourite, was safe: he then delivered them the key of a drawer, in which was fifty guineas. But they knew too well he had much more in the house, and again threatened his life. At length he showed them a large drawer, where were 2700 guineas. This they packed up in two large baskets, and actually carried off, a robbery which, for quantity of specie, had perhaps never been equalled. On quitting him, they said they should leave a man behind, who would murder him if he moved for assistance. On which he very coolly, and with some simplicity, took out his watch, which they had not asked for, and said, "Gentlemen, I do not want to take any of you; therefore, upon my honour, I will give you twenty minutes for your escape; after that time nothing shall prevent me from seeing how my servant does." He was as good as his word: when the time expired, he went and untied the man. Some years afterwards the fellows were taken up for other offences, and known to be those who had robbed Sir Harvey: he was accordingly pressed to go and identify their persons: "No, no," said he, "I have lost my money, and now you want me to lose my time also." When Sir Harvey died, the only tear that was dropped upon his grave fell from the eye of the servant here alluded to, who had long and faithfully attended him. To that servant he bequeathed a farm of 50*l.* per annum, "to him and to his heirs." Sir Harvey's property was estimated at 250,000*l.*, the whole of which was left to the nephew, Mr. Meggot, whose own possessions at the time were, it was imagined, not much inferior, and who, by will, was ordered to assume the name and arms of Elwes. In conclusion of this part of the subject, it may be observed that the popular view of Sir Harvey's character was well expressed in the almost proverbial saying, "that nobody would live with Sir Harvey Elwes if they could, nor could if they would."

To this property Mr. Elwes succeeded when he had advanced beyond his fortieth year. For fifteen years previous to this period he was well known in the fashionable circles of the metropolis. Few men, even from his own acknowledgment, had played deeper than himself, and with success more various. I remember hearing him say he had once played two days and a night without intermission; and the room being a small one, the party were nearly up to their knees in cards. He lost some thousands

at that sitting. Had Mr. Elwes received all he won, he would have been the richer by some thousands for the mode in which he passed this part of his life, but the vowels of I.O.U. were then in use, and the sums that were owed him even by very noble names were not liquidated. On this account he was a very great loser by play. The theory which he professed, "that it was impossible to ask a gentleman for money," he perfectly confirmed by his practice. It is curious to remark how he at this period contrived to mingle small attempts at saving with the unbounded dissipation of play. After sitting up a whole night risking thousands with the most fashionable and profligate men of the time, amidst splendid rooms, gilt sofas, wax lights, and waiters attendant on his call, he would walk out about four in the morning, *not* towards home, but into Smithfield to meet his own cattle, which were coming to market from Haydon Hall, a farm of his in Essex. There would this same man, forgetful of the scenes he had just left, stand in the cold or rain, bartering with a carcass-butcher for a shilling! Sometimes when the cattle did not arrive at the hour expected, he would walk on in the mire to meet them; and more than once has gone on foot the whole way to his farm without stopping, which was seventeen miles from London, after sitting up the whole night. His chief country residence at this period was Marcham in Berkshire, where he had two sons by his housekeeper, to whom he left the whole of his property, with the exception of that portion which was entailed upon Mr. Elwes's nephew Colonel Timms. Of the state of the house at Marcham, that gentleman used to give the following illustration:—A few days after he had gone thither to visit his uncle, a great quantity of rain fell in the night. He had not been long in bed before he felt himself wet through; and putting his hand out of the clothes, found the rain was dripping through the ceiling upon the bed. He got up and moved the bed, but he had not lain long before he found the same inconvenience. Again he got up, and again the rain came down. At length, after pushing the bed quite round the room, he got into a corner where the ceiling was better secured, and he slept till morning. When he met his uncle at breakfast, he told him what had happened: "Aye, aye," said Mr. Elwes, "I don't mind it myself, but to those who do, that's a *nice corner* in the rain!"

On the death of Sir Harvey, Mr. Elwes went to reside at Stoke, and began to keep fox-hounds, the only instance in his whole life of his ever sacrificing money to pleasure, and the only period when he forgot the cares, the perplexities, and the regret which his wealth occasioned. But even here everything was done in the most frugal manner. His huntsman might have fixed an epoch in the history of servants, for in a morning, getting up at four o'clock, he milked the cows; he then prepared breakfast for Mr. Elwes, or any friends he might have with him; then slipping on a green coat, he hurried into the stable, saddled the horses, got the hounds out of the kennel, and away they went into the field. After the fatigues of hunting, he refreshed himself by rubbing down two or three horses as quickly as he could, then running into the house to lay the cloth and wait at dinner; then hurrying again into the stable to feed the horses, diversified with an interlude of the cows again to milk, the dogs to feed, and eight hunters to litter down for the night. What may appear extraordinary, the man lived there for some years, though his master used often to call him "an idle dog," and say, "he wanted to be paid for doing nothing!" No hounds were more killing ones than those of Mr. Elwes. The wits of the country used to say, "it must be so, or they would get nothing to eat." His horses were also the admiration of everybody, yet the whole fox-hunting establishment did not cost him three hundred pounds a year.

From the parsimonious manner in which Mr. Elwes now lived, for he was fast following the footsteps of Sir Harvey, and from the two large fortunes of which he was in possession, riches rolled in upon him like a torrent; and had he been gifted with that clear and fertile head which, patient in accumulation and fruitful in disposition, knows how to employ as well as accumulate, which, working from principal to interest, by compounding forms a principal again, and makes money generate itself; had he possessed such a head as this, his wealth would have exceeded all bounds. But nature, which sets limits to the ocean, forbade perhaps this monstrous inundation of property: and as Mr. Elwes knew almost nothing of accounts, and never reduced his affairs to writing, he was obliged, in the disposal of his money, to trust much to memory—to the suggestions of other people still more. Hence every person who had a want or a scheme, with an apparent high interest—adventurer or honest, it signified not—all was prey to him; and he swam about like the enormous pike, which, ever voracious and unsatisfied, catches at everything, till it is itself caught. I do not exaggerate when I say, I believe Mr. Elwes lost in this manner during his life full one hundred and fifty thousand pounds. But perhaps in this ordination Providence was all-wise. In the life of Mr. Elwes the luxuriant sources of industry or enjoyment all stood still. He encouraged no art; he bestowed not on any improvement; he diffused no blessings around him, and the distressed received nothing from his hand. What was got from him was only obtained from his want of knowledge—by knowledge that was superior; and knaves and sharpers might have lived upon him, while poverty and honesty might have starved. When however his inordinate passion for saving was not concerned, he would go far and long to serve those who applied to him. Such instances as the following are gratifying to select—it is plucking the sweetbriar and the rose from the weeds that overspread the garden. When Mr. Elwes was at Marcham, two very ancient maiden ladies had for some neglect incurred the displeasure of the ecclesiastical court, and were threatened with excommunication. The whole import of the word they did not perfectly understand, but they had heard something about standing in a church, and penance, and a white sheet. They concluded if they once got into *that* it was all over with them; and as the excommunication was to take place next day, they hurried to Mr. Elwes to know how they could make submission, and how the sentence might be prevented? No time was to be lost. Mr. Elwes did that which, fairly speaking, not one man in five thousand would have done; he had his horse saddled, and putting, according to usual custom, a couple of hard eggs in his pocket, he set out for London, a distance of sixty miles, that evening, and reached it early enough the next morning to notify the submission of the culprit damsels. The ladies were *so* overjoyed—*so* thankful: so much trouble and expense! What returns could they make? To ease their consciences on that head, an old Irish gentleman, their neighbour, who knew Mr. Elwes's mode of travelling, wrote these words: "My dears, is it expense you are talking of? Send him sixpence, and he gains two pence by the journey!"

[To be continued.]

[EARLY ENGLISH NEWSPAPERS.]

In the article on Early English Newspapers in No. 500 of the 'Penny Magazine,' we stated that doubt had been thrown on the genuineness of the 'English Mercurie' in the article 'Newspapers' in the 'Penny Cyclopædia,' the MS. of which article was in the Editor's hands prior to the 4th of November, the date of Mr. Watts's discovery. This was indeed the fact; but on further investigation, we find that the passage alluded to was an addition made at a subsequent period, and we therefore readily acknowledge that the whole merit of the discovery belongs to Mr. Watts alone.

INTELLECTUAL PAPER-HANGINGS.

[Pattern for Paper-Hangings.]

" Intellectual Paper-hangings!" exclaims the reader. " Can it be possible that such an idea should enter the brain of any rational being; or more, that he should suffer his imaginings thus to be embodied in type? Is it not enough to endue ' stone walls ' with ' ears,' but we must have them inspired with mind and language also—with senses, affections, passions, and intellectuality?—Surely I am transported to the island of Laputa, and the Magazine I behold is issued by the ' Academy of Projectors of Lagado!' " Well, laugh on, " gentle reader;" thou hadst better let thine eyes run over with mirth than weep them dry at the thoughts of vice or iniquity. But ere thou condemnest the name of a thing, see that it be not in some degree applicable to the object; and, if it prove descriptive of its qualities, refuse not to atone for thy premature contempt by awarding it a portion of thy candid consideration. The observations which have led to the present paper are not of recent date: we have long remarked the unseemly designs which cover the walls of most apartments inhabited by the humbler, nay, even by the wealthier classes of this country; and it has occurred to us that it would be an easy task, not only to render the patterns of paper-hangings more elegant and ornamental, but to introduce a new feature in their construction, which, while it should not detract from the elegance of their appearance, should invest them with a degree of utility calculated to enhance their value in the estimation of all right-thinking persons. We propose to do this by the introduction of a practice which obtains in most eastern countries, particularly in Mohammedan Asia, that, namely, of ornamenting the walls and doors of apartments with pious and moral sentences taken from the Korán, or from the principal oriental poets and philosophers. In Turkey and Egypt this custom almost universally prevails, and no one can enter the apartments of any respectable person or even a shop, without being struck by some pious exhortation or by some moral maxim couched in the language of poetry. Even in the exterior of their houses this practice is observable, and the centre of the door, which in England is occupied by the name of the proprietor or by the words " Ring the Bell," is in Egypt inscribed with a passage from the Korán, to remind the visitor of his religious duties, or of the short duration of human happiness.

The poets of Arabia frequently allude to it, and the English reader will find repeated references to the practice in the ' Tales of a Thousand and One Nights,' which Mr. Lane is now enriching with so many valuable notes on the manners and customs of the East. Even in China (where the rooms of the higher classes are furnished with considerable elegance, though Chinese ideas of taste are very different from ours) the method of

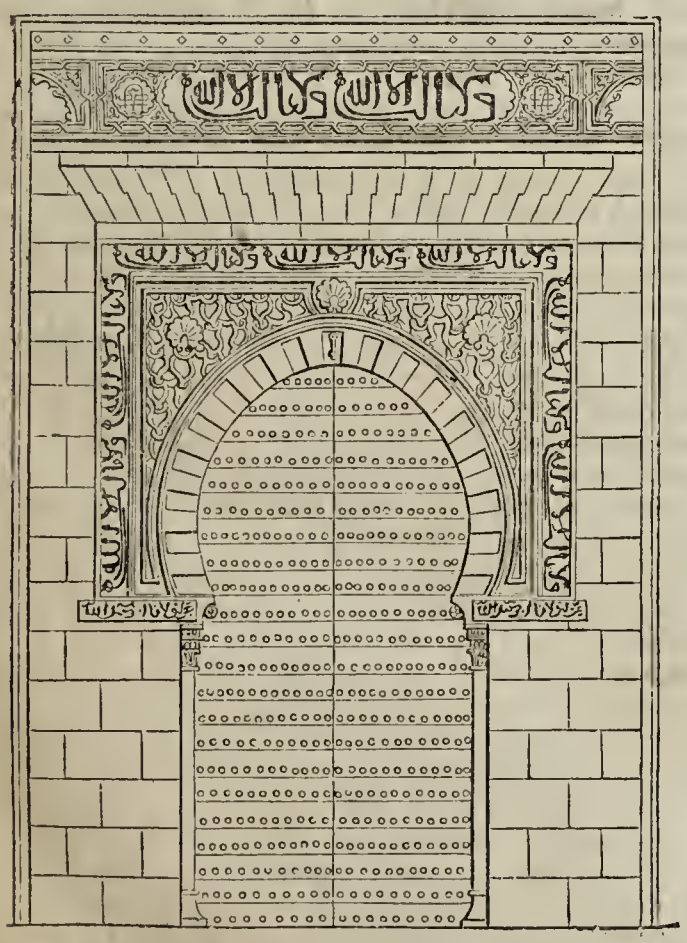
thus ornamenting their apartments is very generally pursued; the selected sentences being painted on long tablets, richly gilt and ornamented, and hung on the walls similarly to our picture-frames.

But indeed, as we have already observed, it is a custom which prevails throughout the East; and although it is in some countries regarded by the vulgar as a charm against evil spirits or in some other superstitious light, it is by those of a higher understanding considered worthy of better uses, and doubtless originated in a religious feeling.

It would not be difficult to trace the practice to a very early period, and to prove that it extended to other countries than those above enumerated; but it is sufficient thus to notice its existence in the present day to avail ourselves of its advantages. That a custom so generally prevalent in the East (whence we have imported so much of comfort and luxury and so much of poetry and romance) should never have been adopted in England appears a mystery. We cannot think that an elegant design on the walls of an apartment can lose anything of its beauty by conveying to the spectator some ennobling thought or virtuous admonition, couched in the language of Shakspere or Milton; nor can we conceive in what way the wisdom of the learned or even the precepts of religion would be depreciated either in value or effect by such a method of communication. We believe we shall not be left solitary in our opinion, that a concise sentence accidentally impressed on the mind will often produce more effect, by starting a train of reflections ultimately leading to a good end, than pages upon pages of dispersed matter intended to produce the same result. An idle humour or the unprincipled thoughts of a vacant hour might be checked by such a handwriting on the wall; while the advice of a Franklin or the satire of a Pope might serve to fix some wavering resolution or turn aside some vicious pursuit.

Having said so much of the principle of our proposed plan and of its employment in other countries, we may now consider it with reference to our own customs, its applicability to our apartments, and especially as regards its adaptation to our paper-hangings.

Its utility would be perhaps more appreciated by the people of England than it would appear to be by the inhabitants of the East, for the former are essentially a thinking people, habitually inclined to possess themselves of the slightest hint and to work out its intentions to its utmost extent; while the people of Mohammedan countries, although to a casual observer they might be considered to be perpetually ruminating on the most important objects, are almost destitute of an idea, and suffer few thoughts of the past or future to disturb the muddy quiet of their minds.



[Oriental Gate.]

As the principle then of the plan may be said to be well adapted to the habits of the English, it remains to consider whether the appearance of written sentences on the walls would or would not disfigure the apartment or the patterns of the paper-hangings on which it is proposed to inscribe them. These sentences might be painted on the wainscot or on tablets fixed to the walls;* but we wish to see more particularly how far the practice is applicable to paper-hangings, and to this we shall confine our remarks, since the introduction of the question of tablets would leads us into another department of ornamental furniture which we do not at prescnt wish to discuss.

The characters of the Arabic alphabet have, when combined and formed into words, considerable pretensions to gracefulness, and it may be objected that the heavy

[Modern Egyptian Doorway.]

* In the British Museum there is a curious volume containing drawings of about forty different tablets, on which sentences selected from antient authors are inscribed, and which once ornamented the apartments of Sir Nicholas Bacon. These sentences are in Latin, and the designs of the tablets afford some good specimens of the taste of the sixteenth century. They are contained in a dozen quarto pages, and are all richly coloured and gilt. On the first drawing is an inscription informing us that they were "painted in the Lorde Kepar's Gallery at Gorhambury, being selected by him out of divers authors, and sent to the good Ladye Lumley at her desire."

appearance of the Roman letters would frustrate any attempt to adapt them to the same useful and ornamental purposes to which we have seen the Arabic characters applied; but if the Chinese find their inelegant method of writing suitable to such purposes, surely we need not hesitate to claim for the Roman characters more indulgence than they generally receive. Yet even if this be difficult to obtain, we have only to point to the old English or German chalcographical characters to indicate a means by which the same purposes of utility may be achieved with an increased effect, so far as regards the elegance of the writing. The old English and German hands may be both rendered greatly superior in appearance to the Arabic characters; and if select sentences in these were enclosed in richly ornamented borders, in wreaths of flowers, &c., the appearance, we conceive, could not fail to be pleasing. The engraving at the head of this paper will convey some idea of our intentions in this respect, and we may make use of it to show how we would have the inscriptions varied. As it would not be very practicable to have a variety of designs printed on the paper, we must suppose that two borders or cartouches compose the pattern of the paper (as in the wood-cut); these may be arranged alternately, both perpendicularly and laterally, until they cover the whole of the walls: and, for the rest, we would have the inscriptions arranged on separate papers, somewhat within the size of the borders, so that they may be pasted over the blank space in the centre of the border or ornament, until every such ornament has an inscription solely to itself. On such a plan, the groundwork being laid by the paperhanger, the younger branches of a family might exercise their taste and ingenuity (as they were in the habit of doing formerly in the manufacture of card-racks, &c.) in the execution of selected inscriptions for the blank spaces.

The design of the borders, or groundwork, would however require the exercise of considerable taste to render it effective; while it would be necessary to observe great circumspection in the selection of the different sentences, so as to exhibit the judgment of the decorator in a praiseworthy light. Persons of bad taste or uneducated minds might certainly render them ridiculous, but the utility of such an improvement in the decoration of the interior of our houses as that we have suggested should not be judged of from its abuse, which, after all, would depend upon the taste of the proprietor.

The thing is certainly feasible enough, and the plan has this advantage, that it is as applicable to the rich as to the poor; for it must be evident that such a mode of adorning the walls of an apartment would not increase the present expense of the common papers used for that purpose, while it is capable of all the ornamental richness which the furniture of a palace would render necessary.

WINCHESTER COLLEGE AND ITS LIBRARY.

[Continued from No. 503.]

FOR the situation of his college, Wykeham purchased of the prior and convent of the cathedral "two medes," called Dumer's Mede and Otterbourne Mede, lying between the Sustern Spyfal and the gardens and closes of Kyngsgate Strete on the west, and the gardens and closes of the Carmelite friars on the south, and a certain house of the said prior and convent, called La Carité, to the east. In the course of six years this great work was finished; when, on the 28th of March, 1393, John Morys, who had been the same day appointed warden, and with him the rest of the Society, made their solemn entrance into the College, chanting in procession. The Society consisted of a warden and ten priests, who were perpetual fellows; a master and second master, seventy scholars, three chaplains, three inferior clerks, and sixteen choristers: in all 105 on the foundation. After the opening of this establishment, Wykeham lived eleven years and a half to see its progress, his death having taken place at Bishop's Waltham, in September, 1404.

Such was St. Mary's College when it first became a separate and independent establishment, and such it remains, with little alteration, to the present day. It is true that kings and popes sought to fortify its stability by charters and bulls; but Wykeham himself had so plentifully endowed it with the 'sinews of war,' that it stood in no need of pecuniary support from any other quarter, except when new buildings or decorations, probably not within the contemplation of the founder, were required. By the papal bulls it received certain privileges and immunities which were highly esteemed in those days, although we of the present time would not set much store by them. Among these were permission to have the sacramentalia and the administration of all the sacraments, the right to a belfry and bells, and a privilege of ordination by any bishop before whom a member of the College should present himself for that purpose.

Notwithstanding all these apparent means of security, the dissolution of this College and the seizure of its property were included in the act 37 Henry VIII., c. 4. But though this statute remained in force for two years, Henry died soon after its enactment, and it was never carried into execution; and when Edward obtained an act of dissolution, ratifying in great part that of his father, Winchester College was specially exempted, along with Eton and the two Universities. Westminster, which, as well as Eton, had been formed something on the model of this one, had never worn so monastic an air, and therefore such enactments would not apply to it. During the the parliamentary ascendency, the existence of Winchester College was again menaced, and would have been swept away, had it not been that either Fiennes, who was of Wykeham's kin, or Love, whose father had been warden here, had not averted the stroke until the wheel of political fortune turned round, and institutions of this kind were no longer in danger. Since then the wardens and fellows have sat under their vine and their fig-tree in plenty and in peace. Wykehamists are numerous and respectable in most parts of the country, and many of their names stand high in the list of modern literati, especially in the poetical department.

Winchester College is situated immediately to the southward of that part of the old wall of the city which used to defend the apartments appropriated to the lodging of poor strangers in the cathedral. These buildings formed the south side of a large square, along the north side of which ran the infirmary, and on the east side the workshops for the monks; while the west side contained the apartments for guests, the prior's quarters, and the chapter-house. The greater part of these buildings have been long since removed, and the site of them is now occupied by houses and gardens belonging to the dean and members of the chapter. The city wall is also in great part removed, or has been transformed into a common garden wall. The ditch also has been filled up, and is partly occupied by houses and gardens, some of which belong to members of the College. College Street extends along the south side of these, and the College stretches about 150 feet along the south side, and so close to the carriage-way as to admit of only a very narrow pavement. The north-eastern angle is nearly opposite to the south-western one of the once strongly fortified Wolvesey Castle, part of the walls of which are still nearly entire. From this angle the buildings of the College extend southward for about 170 feet; and at the south-east corner, which abuts upon one of the many streams of the Itchen, there is situated the College-mill, which is turned by a stream that flows through great part of the city, and is one of those branches of the river

which was brought into this course according to the plan and under the direction of Bishop Ethelwald. The other sides of the cluster of buildings are very irregular, and with the exception of a portion on the north-west, they open upon fields belonging to the College, containing the home play-ground of the scholars, and the infirmary and some other offices, and forming, with the space occupied by the College, and a large garden belonging to the warden, which lies along the whole eastern side of the buildings, the two "medes" which Wykeham purchased from the prior and convent of the cathedral. The situation, though low, is by no means either damp or unhealthy; for the current of the river, and the constant exchange of the atmosphere between the downs and the meadows, and also between the upper and lower parts of the valley, keep the air in continual and healthy motion. Indeed it is from this stirring of the air over the ground which it occupies, that Winchester derived its name—*Caer Guent, Cather an Vian*, meaning 'the stronghold in the place of winds.'

The front which this celebrated school presents to the street is anything but handsome, the left flank westwards being occupied by sundry offices, and the east by a façade of the warden's house, the style of which is neither ancient nor modern. Intermediate between these, however, there is an arched gateway, or *porte-cochère*, and this, though by no means handsome, gives sign that the range of building of which it occupies the centre is something different from a row of ordinary dwelling-houses. Over this gateway there is a canopy, supported at the extremities by time-worn busts of a king and bishop, which are generally supposed to have once been the effigies of Edward III. and William of Wykeham. In the front of the tower above this canopy there is an ornamented niche, containing, in tolerable preservation, a statue of the Virgin Mary crowned, with a sceptre in her right hand and the infant in her left; and in the groining of the archway under the tower the arms of Wykeham appear on the intersections of the arches.

This gateway leads to the first court or square, or rather oblong, the court end of which is occupied by the warden's house, which advances upon and conceals some portion of the south side; and the rest is taken up by dormitories, offices, and other common apartments. The tower over the gateway leading inwards from this first quadrangle is rather more ornamented than that towards the street; and the upper part of it is ornamented by three niches in rich but not gaudy style. The middle niche contains a full length figure of the Virgin Mary, with a book in her left hand, and her right hand elevated towards a figure of the angel Gabriel, which occupies the right hand niche, and is pointing to a scroll inscribed with the words, *Ave, gratia plena* (Hail, full of grace). The third or left hand niche contains a representation of Wykeham, in his episcopal robes and mitre, supplicating the blessing of the Virgin, whom, according to the custom of the times, he had chosen as his patron saint. The eastern or left wing of this front is, as we have said, in part concealed by the modern buildings, which thus throw the tower out of the centre, and destroy the symmetry of the whole. The archway under this tower leads to the second quadrangle, which is not so long, but broader, and therefore better proportioned than the first. The buildings in this quadrangle are also in far superior style; and in so far as they are from the designs and executed under the direction of the founder, they display that classical simplicity and strength which are so conspicuous in every work that he designed or erected. On the south side of the entrance tower, facing this quadrangle, the same figures of the Virgin, the Angel, and the Bishop, which are on the north side, are again repeated; and on the western part of the south side there is a representation of Michael overcoming the Dragon, in a niche of the same size and finish as that upon the tower. The left or west wing of this south side of the quadrangle is occupied by the dining-hall, the walls of which are supported by bold and massy buttresses, and the windows large and high, and much enriched by mullions. This hall is a splendid room, in the ancient Gothic style, measuring 63 feet in length and 33 in breadth. The roof is lofty, and without ceiling; but with the beams and rafters appropriately ornamented, especially with bosses at the intersections. The people of the middle ages never ceiled their dining-halls either with stone or with wood, but left them clear to the roof, and with some means of ventilation for carrying off the fumes of the dinner; and this roof is elevated, and has openings for this purpose, but so contrived as that neither rain nor a current of air shall find entrance. The trusses of the roof are supported on the walls by ornamented corbels, which chiefly represent the heads of kings and bishops. The ascent to this hall is by a flight of steps in the south-western angle of the court; and by the bottom of the stairs there is a lavatory, where the members of the College performed their ablutions as they went to and from their meals, personal cleanliness having been strictly enjoined in all establishments of the kind. We believe that the scholastic exercises used to be given out and heard in the apartment under this hall; and that when the weather was too severe for the same being performed in the cloisters, they used to frequent the hall for private study, under the superintendence of the prefects, in the intervals between their meals. The west wing contains the kitchen, which is an ample apartment well suited for its purpose; and we believe there has been at no time the slightest necessity for complaining of any deficiency of the larder. In an apartment near the kitchen there is a very singular figure in oil painting, usually termed "the trusty servant," and intended perhaps as a standing admonition to the servants of the establishment. It is what may be called a *Homoporcocervoasinus*, being made up of several parts of a hog, a deer, and an ass, a sturdy human being in the costume of a servant, and with loads of kitchen implements in his hands, being the stock upon which the long ears, the snout with its padlock, implying silence, and the cloven feet of the deer are grafted, which makes the whole look a strange fellow indeed. Lest the ingenuity of the contriver, whoever he may have been, of this strange similitude, should be lost upon any of its admirers, its attributes and their uses are set forth in two explanations, one in doggrel Latin verse, and another in yet more doggrel English.

The eastern or right wing of this south side of the second quadrangle is occupied by the chapel, the architecture of which externally corresponds very well with that of the hall; and over the centre of this line of building there was a stately tower with turrets, and pinnacles at the corners, and containing a ring of five bells. This tower was not erected by Wykeham, but by Robert Thurburn, the second warden, who was appointed in 1413, nine years after Wykeham's death, and built this tower in 1430; and other wardens have made further additions and alterations, some for the better, and others for the worse.

The chapel is 33 feet wide, the same as the hall; but the length of it is 102 feet. It consists of a chapel and ante-chapel, the latter having rather an unseemly extension southward under the tower. The shell of the chapel itself is in very excellent style. The windows are spacious, and filled with stained glass; and the roof, which is made of oak in imitation of a groined roof of stone, is at an appropriate height, and very tasteful, being exactly in the same style as the ceiling, of the same kind, which is over the presbytery of Winchester cathedral. The great east window is spacious in its dimensions, and has its mullions very chastely disposed, and being entirely filled with stained glass, it throws a dim but warm and mellowed light over the whole interior. It has been the subject of prose

description, and also the theme of song in a descriptoeulogic poem by Bishop Lowth, the biographer of Wykeham. The principal story is the genealogy of Jesus Christ; and the names and characters of the several persons are made out without any difficulty; in other parts of it there are more modern subjects, among which may be discerned the apostles Peter and Paul. In the centre there is the Crucifixion, and in the upper part the Resurrection; but the latter is modern, having been restored by an artist of Winchester. There is also a label, in church characters, and inviting the visitor to "Pray for the soul of William of Wykeham, founder of this College." The other windows are also filled with stained glass, exhibiting a numerous and merged collection of kings, bishops, priests, abbots, nuns, and other worthies, the characters and labels of which cannot be very well made out without a glass. The dim light admitted by the windows and the dark colour of the oaken ceiling give a peculiarly solemn air to the interior of this chapel. The altar-piece is appropriate to the ornaments which Wykeham himself distributed over so many parts of these buildings, although the placing of it there is comparatively modern. It was presented to the College by Doctor Burton, who was head master during some part of the eighteenth century. The painter's name is Le Moine, an artist of but little celebrity; but still the picture is a pleasing one. The subject of it is the Annunciation of the Virgin, being the same which Wykeham himself had repeated on the north and south sides of the tower over the gateway leading to the second quadrangle. It is understood that very little costly plate belongs to this chapel; and it has been surmised, though we know not with what truth, that the rich furniture which it once possessed was given to Edward VI., in order that, thus bribed, the College might be exempted from the penalties of the act of dissolution. We should be slow in giving credit to a charge of this kind; but it is certain that the chapel once possessed splendid plate, which is now gone, without any account of the mode of its going being recorded. Among other things it is expressly mentioned that Henry VI. bestowed upon it a tabernacle of gold, with a chalice and phials of the same costly materials; and these do not seem to have made their appearance in modern times.

[To be continued.]

Labour.—Bread, wine, and cloth are things of daily use and great plenty; yet notwithstanding acorns, water, and leaves or skins, must be our bread, drink, and clothing, did not labour furnish us with these more useful commodities; for whatever bread is more worth than acorns, wine than water, and cloth and silk than leaves, skins, or moss, that is solely owing to labour and industry: the one of these being the food and raiment which unassisted nature furnishes us with; the other provisions which our industry and pains prepare for us, which how much they exceed the other in value, when any one hath computed, he will then see how much labour makes the far greater part of the value of things we enjoy in this world.—*Locke's Essay on Civil Government.*

Popular Russian Prints.—If you desire to feel the eccentric movements of the Russian pulse and phrenologise upon the protuberances of the national skull, in so far as you deal with the weaker shades of character, you must noway omit paying a visit to the picture-booths in the Moscow "rag-fair." These progeny of Muscovite imagination issue from an aboriginal manufactory, into the darkness of which no modern light has hitherto penetrated, and are painted with the pure and unadulterated hues of the Sclavonian taste, such as it may have existed some centuries ago. The principal vent for this manufacture is at Moscow, the heart of the empire, and immense quantities of the article are supplied from hence to the remotest corners of Russia. They are all more or less of a religious, or rather of a mythological and allegorical cast, and serve as well for the purpose of papering for drinking-shops as of decorations for the peasants' cabins. There is not an occurrence of note, from the creation down to the closing of the Dardanelles, which is not held forth in red, green, and yellow, to the credulous "wonderment" of the native. Pandemonium however appears to me to come in for a much larger share of favouritism than its antipode; the daubs have more to do with devils than angels. Death, and Satan, and Gospodin Sträptschik, as the Russian calls him, the devil's adjutant, cut a far more conspicuous figure than seraph or cherubim. Here you will meet with the whole host of monsters depicted in the Apocalypse, whether Babylonish, Assyrian, Macedonian, or Roman. Strange the incongruity!—the divinities of Athens and the City of the Seven Hills looking down upon the household ways of a coarse serf. The originals of these prints bear traces of Greek descent, for I remarked types of them along the walls and passages of several churches and convents, and have the similitudes before me, not however without many an additional conceit from the brains of the artist. I well remember, for instance, to have seen, when I was exploring the convent of Novospassky, the four great monarchies of our globe with serpents' tails coiled round them, and an enormous dragon, grinning his huge teeth, sitting cheek by jowl in friendly concave. There is a vast deal of humour in many of the subjects. One of them had the words "Donesehnoi Diavvol" (the money-devil) inscribed in large characters over it, and it now figures among the souvenirs of my journeyings. It represents a crimson-coloured devil hovering over the earth, showers of gold falling down from his hands, feet, nose, and mouth, nay, ducats ensconced among the coils of his wig. Gospodin Sträptschik, his highness's adjutant, is seen riding behind him on a yellow monster and bidding him speed by the instrumentality of Mercury's caduceus. The ground beneath is a hurly-burly of human beings, eagerly catching at the golden shower. Here you have a baker, who has entwined the prince of darkness with a thick rope, striving to drag him down to him. Next comes a cobbler, unable to accomplish more than to fasten a line of packthread to his toe, and appears likely to get but little for his pains. Then we have a publican bringing out all his stock of barrels, bottles, and pots, and giving free exit to their spirituous contents, in order that they may catch the enriching drops; while in the martyrdom of his thirst after them he raises his goblet on high to make caption of some stray ones which are falling behind him. Next we have a fair dame in all the majesty of Muscovite beauty, to wit, each cheek crimsoned with a thick layer of red paint and redolent with *en-bon-point*, such as would well become a city alderman. Aloft you see a papa (priest) mounted on his pulpit, stretching out his left hand as if to enforce his doctrine, and holding out his cap in his right to stay some particles of the shower in their descent; his infernal majesty, *ad interim*, pouring down blessings upon him by handsfull. In the immediate vicinity of the pulpit there is seen one of the church vessels, into which a whole beam of gold is glancing. The most singular character in the motley group is a shivopissetz (an artist or painter); a brace of squirrels are dancing on his shoulders, a number of butterflies are fluttering in the air, which are tied to his cap by fine threads, and the cap itself is bedizened with quills and brushes. The churl of the pallet is placed away from the rest, beyond the reach of the golden rays, firing a pistol in the air—a sorry experiment this, for were he even to hit his mark, he would be no gainer by it, seeing that the devil and all his treasures would necessarily pounce down among the other dramatis personæ. In one corner appears a little monkey of very wise and staid features, looking on with much listlessness, his hand raised, and seemingly haranguing the crowd, though none stops to hear him. I could not make out the meaning of the words which are coming out of his mouth. Of this description are many of the humourous products of the Moscow plastic press.—*Notes of a Journey in Russia.*

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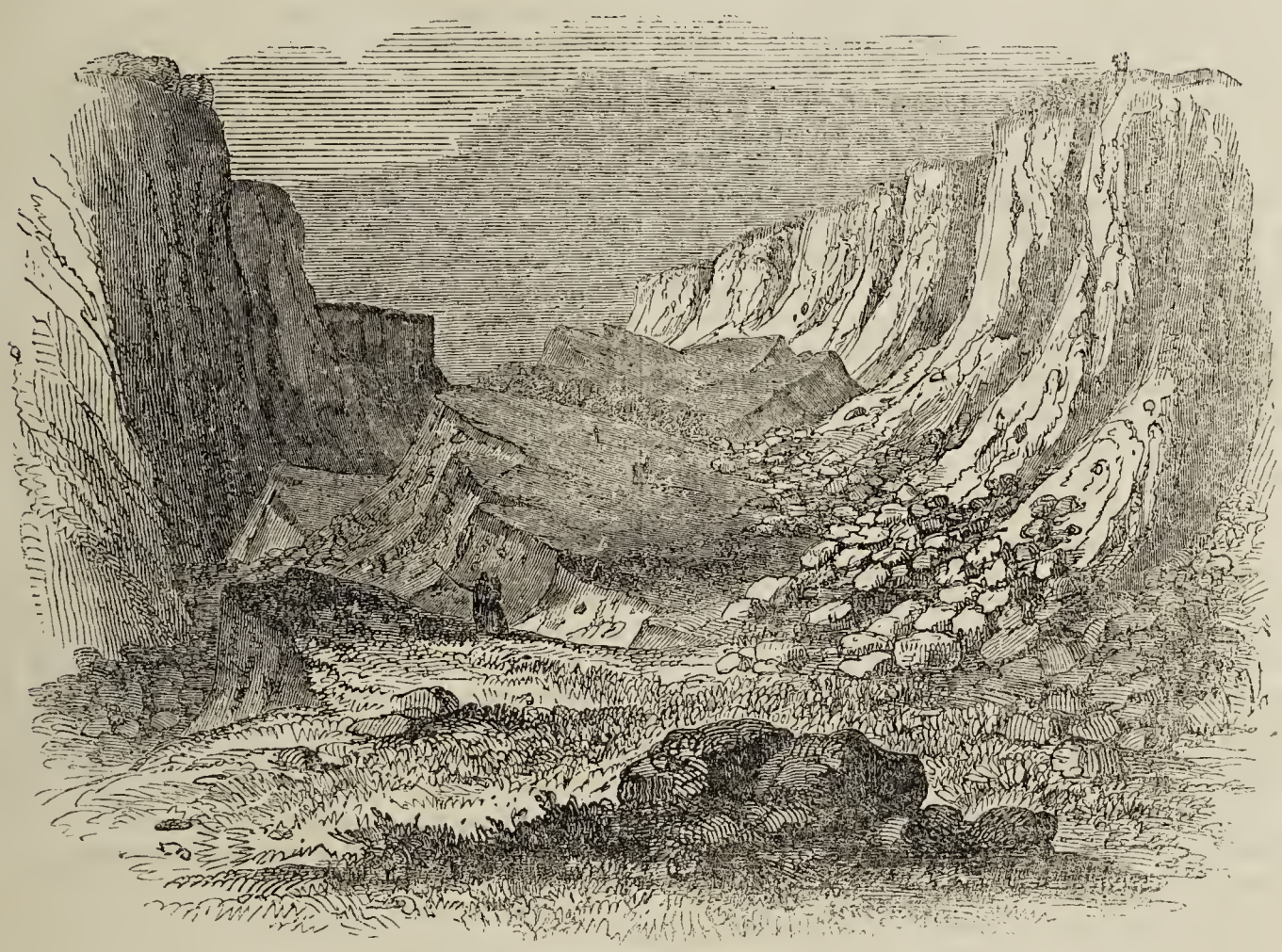
THE EXTRAORDINARY LAND-SLIP NEAR AXMOUTH, DEVON.



[View of the Land-slip near Axmouth, Devon, looking west.]

[From a Correspondent.]

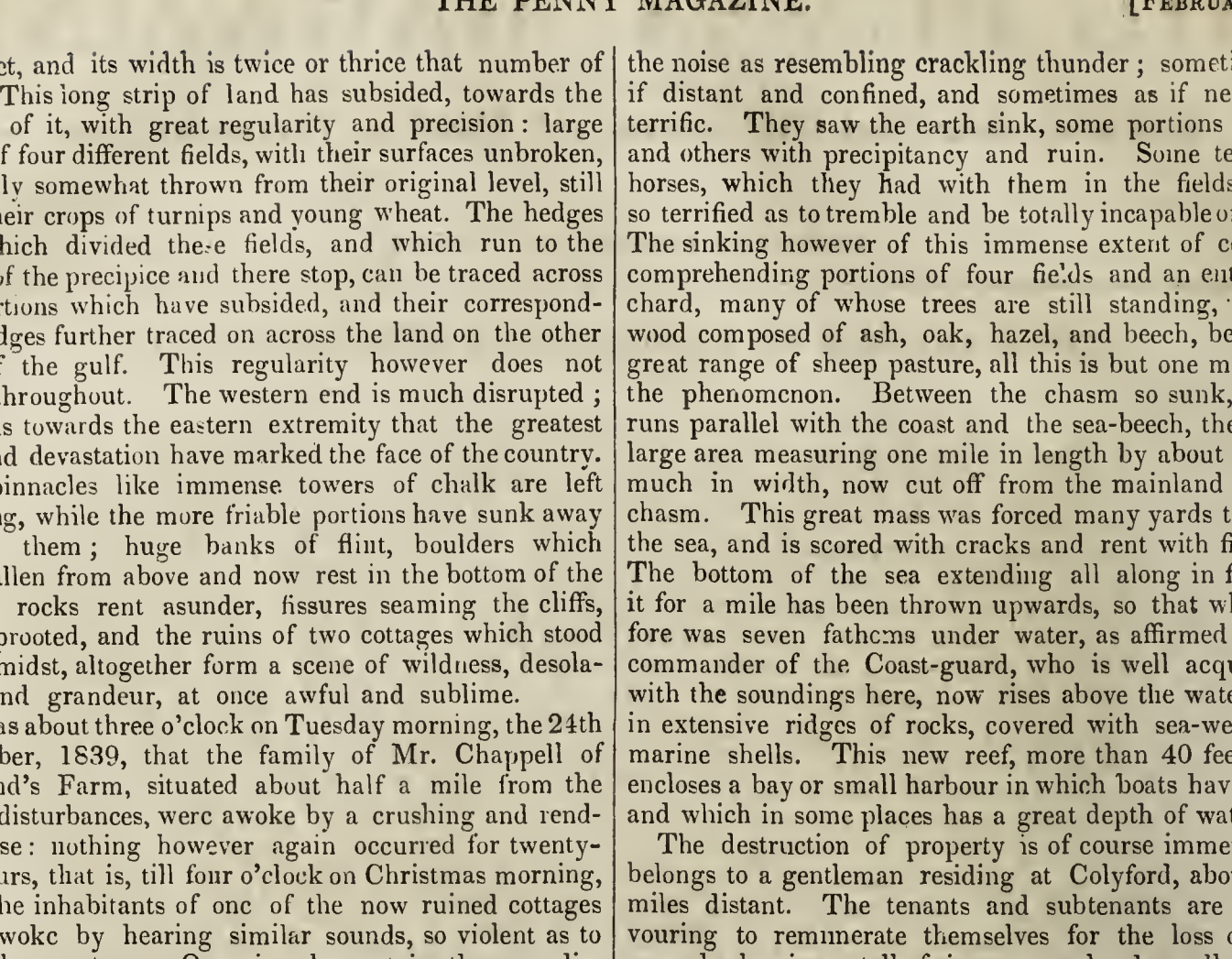
THE phenomenon of which we are about to speak is of such rare occurrence, and of so extraordinary a nature, as to deserve the consideration and interest not only of geologists, but of every thinking person. It had been asserted at first that the convulsion was literally an earthquake; but on examination of the spot, and on considering the position of the strata and the external producing causes acting on them, this supposition will probably be given up. Whatever may have been the cause, the devastation and the ruin produced, and the disruption of the whole district extending nearly one mile and a half, are equal, within the space, to the effects of many volcanic eruptions of Southern Europe or of Mexico. This is not however the first time that the southern coast of England has been visited by a like occurrence; similar convulsions have occurred in the Branscombe Cliffs west of Beer Head, at the Pinhay Cliffs near Lime, and the Undercliff in the Isle of Wight. But no record or account of these, as to the age in which they happened, is now existing, either written or traditionary. Setting aside the idea then, that subterranean fire has been the agent, we must look to something else; and we come to the conclusion that water, acting on the soil of the district, predisposed from its nature to be so acted upon, has been the main cause. In order to enter on a brief explanation of this, it is necessary to mention the position and distribution of the series of rocks running along this coast. First we have the chalk; this rests on a stratum of moderately indurated sandstone, alternating with beds of that species of flint denominated chert: this lies on the new red-sandstone formation, or red marl; or, as it is provincially termed in the neighbourhood, "fox-mould:" and this last is incumbent on the lias, in which there occurs a great quantity of tough and impervious clay. The fox-mould is confidently supposed to be the formation in which the great disturbing causes have arisen; for it is of a loose, spongy nature, and imbibes all the moisture which falls on the surface in the form of rain, or which filters through the upper strata from distant springs. This moisture could not subside to the lias below, owing to the imperviousness of the clay, which resists it there, and on which the water rests, as on the bed of a well puddled canal. Where these strata therefore show their basseting edges, or where they crop out along the declivity of the cliff, springs will be seen issuing from the soft fox-mould immediately above the clay. In the course of ages these springs carry with them, slowly but inevitably, great quantities of the friable and loose earth, undermining the superincumbent strata, and preparing them for a subsidence as soon as an extraordinary wet season, such as we have just experienced, shall both hurry away more of the remaining support from beneath, and saturate with a greater weight of moisture the several soils above.

The chasm runs east and west, nearly a mile and a half in length, and somewhat curved; the convex part of the curve being toward the north, and the centre of the circle, of which it forms a segment, towards the south. The depth of the chasm is said to be between 200 and

300 feet, and its width is twice or thrice that number of feet. This long strip of land has subsided, towards the middle of it, with great regularity and precision: large areas of four different fields, with their surfaces unbroken, and only somewhat thrown from their original level, still bear their crops of turnips and young wheat. The hedges too, which divided these fields, and which run to the brink of the precipice and there stop, can be traced across the portions which have subsided, and their corresponding hedges further traced on across the land on the other side of the gulf. This regularity however does not range throughout. The western end is much disrupted; but it is towards the eastern extremity that the greatest ruin and devastation have marked the face of the country. Vast pinnacles like immense towers of chalk are left standing, while the more friable portions have sunk away around them; huge banks of flint, boulders which have fallen from above and now rest in the bottom of the chasm, rocks rent asunder, fissures seaming the cliffs, trees uprooted, and the ruins of two cottages which stood in the midst, altogether form a scene of wildness, desolation, and grandeur, at once awful and sublime.

It was about three o'clock on Tuesday morning, the 24th December, 1839, that the family of Mr. Chappell of Dowland's Farm, situated about half a mile from the actual disturbances, were awoke by a crushing and rending noise: nothing however again occurred for twenty-five hours, that is, till four o'clock on Christmas morning, when the inhabitants of one of the now ruined cottages were awoke by hearing similar sounds, so violent as to make them get up. On going down stairs the man discovered that the floors of his cottage were thrown out of their level, and the door so warped and jammed that he was unable to open it without violence. He found that several large fissures were running through the ground on which his dwelling stood; and he instantly hurried off to Mr. Chappell his landlord, to mention the circumstance. The whole of Christmas-day the convulsion continued, and was witnessed by several persons whom the writer has conversed with on the spot. They described the noise as resembling crackling thunder; sometimes as if distant and confined, and sometimes as if near and terrific. They saw the earth sink, some portions slowly, and others with precipitancy and ruin. Some teams of horses, which they had with them in the fields, were so terrified as to tremble and be totally incapable of work. The sinking however of this immense extent of country, comprehending portions of four fields and an entire orchard, many of whose trees are still standing, a large wood composed of ash, oak, hazel, and beech, besides a great range of sheep pasture, all this is but one moiety of the phenomenon. Between the chasm so sunk, which runs parallel with the coast and the sea-beech, there is a large area measuring one mile in length by about half as much in width, now cut off from the mainland by the chasm. This great mass was forced many yards towards the sea, and is scored with cracks and rent with fissures. The bottom of the sea extending all along in front of it for a mile has been thrown upwards, so that what before was seven fathoms under water, as affirmed by the commander of the Coast-guard, who is well acquainted with the soundings here, now rises above the water-level in extensive ridges of rocks, covered with sea-weed and marine shells. This new reef, more than 40 feet long, encloses a bay or small harbour in which boats have been, and which in some places has a great depth of water.

The destruction of property is of course immense: it belongs to a gentleman residing at Colyford, about five miles distant. The tenants and subtenants are endeavouring to remunerate themselves for the loss of their crops by levying a toll of sixpence per head on all visitors who trespass on their fields. It is said they are taking 7*l.* a day in this manner. This however gives but 280 visitors daily; whereas during the first week after the catastrophe the cliffs were so thronged, that they stood, as the farmer expressed it, "as thick as a flock of sheep." Unfortunately for them the idea of levying toll did not occur at first, nor until they discovered that so much of their crops as had not fallen away were being destroyed by being trampled under foot.



[Plan of the Land-slip near Axmouth, Devon.]

CULTIVATION OF THE TEA-PLANT IN ASSAM.—No. I.

Pepys, secretary to the admiralty in the reign of Charles II. and James II., says, in his pleasant and gossiping Diary, dated 1661, that he "sent for a cup of tea, a Chinese drink, of which he had never drank before." Early in the last century tea had come more into use, and in 1734 the consumption amounted to 632,374lbs. In 1838 the quantity of tea consumed in the United Kingdom was 32,351,593lbs., or it may be stated in other words at nearly 400,000 chests, weighing in the aggregate above 1400 tons. The duty of 2*s.* 1*d.* per lb. produced the sum of 3,362,035*l.* The large quantity of tea every year required for the consumption of this country has hitherto been obtained solely from the Chinese, with whom we have long had commercial relations, though for some years our intercourse has been in an uncertain and unsatisfactory state, and at this moment is totally suspended. The price of tea is in consequence higher than it has been at any time since the opening of the trade to China in 1833, and there is every prospect of the advance being maintained for a considerable period, at least until the present differences are settled. It is not however the suspension of the trade—for that may be only temporary—which gives importance to the subject of the present notice, but its connection with the welfare and happiness of that mighty empire placed under our dominion in India. The interruption in the supply of tea through the ordinary channels may render idle British capital employed in commercial shipping, but as it is not likely that the Chinese should carry their anti-social policy so far as to exclude all foreigners from Canton, we might, even though shut out ourselves, still rely upon being supplied with teas by other nations, who would gladly become our carriers. The present state of our intercourse with the Chinese is undoubtedly a subject of great interest, uncourteous as they are to the English and other foreign 'barbarians;' but, as we stated before, the trial now making in Assam to cultivate the tea plant for commercial purposes derives its importance from the advantages which the introduction of a branch of industry suited to their quiet and sedentary habits will confer upon our fellow-subjects in India. They have been deprived of their occupations in many instances, and their skill and industry have been superseded by the power-looms of Manchester and Glasgow; but if we could be supplied with tea from India instead of China, such an employment as the cultivation and making of tea would promote peaceful habits of industry among the Hindoos, would render the slopes of barren mountains fruitful, and add an additional staple for export equal in value to that of the aggregate mass of indigenous articles now shipped to England, and thus prevent the loss in exchange which the East India Company experience in remitting home their territorial revenues. It is on these grounds that we regard the Assam experiment with feelings of no ordinary interest; and the following account of the circumstances under which it originated is drawn up from authentic sources, under the conviction that many of the readers of this work are likely to entertain a similar feeling.

When we consider that all the indigo formerly used in England was grown in South America, and that now, out of 7,000,000lbs. imported into this country each year, less than 150,000lbs. is from that quarter, while from India, where attention only began to be paid to the cultivation of indigo about the commencement of the present century, we obtain 6,500,000lbs., or thirteen-fourteenths of the whole quantity imported, and that in some other commodities the like revolutions have occurred, we are prepared to see without surprise similar changes in process in respect to tea or any other article of extensive consumption. These vicissitudes, indeed, are always worthy of attention, as they involve the practical application of a knowledge of botany or physical geography, of geology, or some other department of knowledge, and sometimes they illustrate the spirit of commercial intercourse betwixt nations.

The tea-plant, it must be observed, is capable of enduring great variety of climate, though often considered indigenous to China. It flourishes over a space greater than most plants, thriving luxuriantly within the tropics, and growing in sheltered situations in Devonshire and Cornwall; but though it sustains itself tolerably well in this country, it does not blossom with us except when stimulated by the artificial heat of the conservatory. The apparent ease with which the tea-tree is naturalised, and its commercial value, have led to its introduction in various quarters. It has been cultivated by the Japanese, Javanese, and Burmese, for the sake of the leaf; and in Brazil, Carolina, the Caribbee Islands, Martinique, Penang, New South Wales, Ceylon, St. Helena, Corsica, and even in the environs of Paris attempts have been made to naturalise it with the design of deriving a profit from its produce. The failure which has attended the experiment in all the latter countries is to be attributed to uncongeniality of temperature or soil, or to the combined defects of both. Du Halde states that even in China the leaves produced from the tea-plant, when it grows on a clayey soil and in a low situation, are very inferior, and yield even a disagreeable flavour. To all appearance the plant is as flourishing as those which produce the best kind of tea, and yet the leaves do not possess their genuine properties. The vine, the tobacco, rhubarb, poppy, and many common garden plants are occasionally defective in flavour from an analogous cause.

If we look to China, we find the great tea districts from which Europe is supplied extending from latitude 27° to 31° north. These districts are remote from the sea; the surface of the country is hilly and mountainous, and the soil light and gravelly; the climate moist, but not immoderately so; the winter of six weeks' or two months' duration, and in summer the sun is extremely powerful. All attempts to render the tea-plant an object of profitable cultivation are sure to fail unless the soil, temperature, and situation of the place where it is transplanted are such as are naturally congenial to it. The best teas of China are produced over an extent of country whose mean annual temperature ranges from 54° to 73°; the heat of summer not descending below 80°, and the cold of winter ranging from 54° to 26°: a mean annual range of from 56° to 64° is considered the most favourable temperature. The sides of mountains or considerable hills on their southern aspect, and where the soil consists of the disintegrated rock, is the best situation for planting.

Such being the conditions necessary to enable the tea-plant to arrive at perfection, we must attribute the numerous failures which have occurred to insufficient information concerning the physical geography of the parts where it is known to be most successfully cultivated. The gross blunders which have been committed can be accounted for on no other ground. One gentleman who established a large tea plantation at Penang found, on the arrival of the season for gathering the leaves, which were thick, hard, and leathery, that on infusion they had acquired slightly emetic properties. Early in the present century the cultivation of the tea-plant was commenced on a large scale at Rio Janeiro; Chinese were introduced to prepare the leaves, but the flavour of the infusion was so far from being such as could be wished, that the plantation was necessarily abandoned.

Penang is situated near the equator, the temperature is equable during the whole year, but the mean annual heat is 80°, and the annual fall of rain is excessive, amounting to eighty inches. Rio Janeiro is also within the tropic, and here also the mean annual heat, as well as the moisture, is too great. We need not proceed further in pointing out the cause of failure in other cases where the temperature, situation, and other circumstances

differed widely from those which prevail in the tea districts of China.

Nearly half a century ago (in 1793) Lord Macartney, while on his embassy to China, procured a supply of tea-plants and sent them to Bengal, believing, as Staunton says, that that part of India contained districts which would prove favourable to their cultivation. We do not know what was the fate of these plants. Dr. Wallich noticed, in 1818, a tea-plant thriving vigorously in Nepaul. About the year 1820, Mr. Bruce penetrated into the forests of Sudiya, and found the wild tea-tree. In 1826, it appears that Mr. David Scott, then employed in the district of Munnipore, sent to Calcutta specimens of the leaves of a shrub which he asserted to be the real tea-plant, and though there is considerable difficulty in distinguishing the *Camellia* from the tea-tree, subsequent events are in favour of Mr. Scott's discovery. In 1827, when Lord Wm. Bentinck was appointed Governor-general of India, an intelligent gentleman of the name of Walker urged upon his Excellency the great advantage which India would derive from the successful introduction of the tea-plant; and in 1832, at the request of the Right Hon. Charles Grant (now Lord Glenelg), who was then secretary of the Board of Control, Dr. Wallich drew up a valuable paper containing a series of observations on the cultivation of the tea-plant for commercial purposes in the mountainous parts of Hindustan. Fortunately the Governor-general became impressed with views of a similar nature, and in an official minute dated January, 1834, he laid down for consideration the question "whether there are not reasonable grounds for the conclusion that there must be, in all the varieties of climate and soil between the Himalaya and Cape Comorin, combinations of both that must be congenial to this particular plant; and next, how far it may be practicable to have from China cuttings of the tree and best descriptions of the plant, and knowledge and skill for its cultivation, and for the subsequent process of preparing the leaves for use." There began now to be prospects of fairly realising the project of cultivating tea in India, and this minute of the Governor-general's concluded by strongly recommending the attempt. On the 1st of February, 1834, the Governor-general appointed a committee for the purpose of devising a plan to be laid before government on the best means of accomplishing the proposed object and superintending its execution. This committee was called the "Committee of Tea Culture," and consisted of gentlemen of high character and great intelligence resident at Calcutta.

[To be continued.]

ON TELEGRAPHIC COMMUNICATIONS.

THE saving of time is one of the great features which distinguish a busy nation from others whose transactions are of less extent and importance. In the application of steam-power to manufacturing purposes, in propelling ships by the same power, in the employment of a railroad as a medium of communication between distant towns, the saving of time, although not the only, is the chief advantage gained over previous arrangements. It is precisely in the same light that we are to view the object and utility of *Telegraphs*, instruments employed for the communication of intelligence to a distant station in a very short space of time.

In the common events of life, speaking and writing are sufficient to serve as agents for communicating our thoughts to others; but when a considerable distance separates the parties, *loss of time* is an inevitable accompanying difficulty. The human voice, under ordinary circumstances, cannot be heard beyond a limited range. There is, indeed, an instance on record, in which persons have conversed at a distance of one mile and a quarter: this occurred when Captain Parry was at Port Bowen, in one of his winter-quarters, on which occasion two persons conversed at the distance here stated, a broad surface of ice separating them. But this is of course an extreme case, and is as little to be taken as a standard of the audibility of sounds, as is a well authenticated case in the opposite extreme, where, during the American War, the motions of a drummer beating his drum were distinctly visible, while the sound was totally inaudible: in this case, a thick mass of *snow* covered the intervening ground. We know, however, that in common circumstances the voice is audible only within a very limited distance.

On the other hand, if the communication be made in writing, the distance may be unlimited, but the messenger, the mail, the ship, consumes time in conveying it. None of the ordinary methods by which speed is attained are sufficient to overcome this difficulty, and, except in particular cases, we do not recognise the difficulty as a fatal one; we are willing to conform to what appears inevitable. But suppose a necessity to arise for the immediate conveyance of intelligence to a distance: suppose that an army is divided into different corps, and spread over a great extent of country; that any central body whatever wishes to issue orders of importance to its agents scattered far and wide; that a country is in danger of foreign attack; that the government at the capital is desirous of hearing important news from a seaport; that this news is of a kind that ought to be known throughout the whole country: in any such case, every minute teems with importance; and half a dozen words expressed and communicated instantaneously might be of more value than a whole document if delayed several hours. Such circumstances have occurred, the desirableness of such rapidity of communication has been felt, and the means of accomplishing it have been devised. All such means are called *Telegraphs*, a name derived from two Greek words, which, as well as the German name *Fernschreibmaschine*, imply *distant writing-machine*.

Before machines deserving the name of telegraphs were invented, signal-lights were frequently used in naval and military operations. Large fires, torches, rockets, &c. have been employed to produce a signal which shall be visible to a great distance; while drums, trumpets, explosions of gunpowder, firing of cannon, &c. have been used as audible signals. The writings of so many ancient authors contain allusions to such contrivances, that there is no doubt of their extensive use in early times. Still, however, such means were inadequate to the carrying on of conversation: a very few preconcerted signals were all that could be attained. It was not, indeed, until 1793 that the term *telegraph** was applied to any machine for such a purpose, or that a distant conversing-machine was actually brought into public use. Yet such a contrivance had been suggested more than a century before. The Marquis of Worcester, in his 'Century of Inventions,' speaks of a method of holding converse with distant persons both by night and day; but he gives no account of the means. Dr. Hooke, in 1684, made a suggestion which was in every way more clear and satisfactory. He proposed, that in order to keep up a communication between two distant places, certain elevated intermediate stations should be chosen, and at each station persons provided with telescopes capable of commanding a view of the adjoining stations. At each station should be erected a frame-work, from which is suspended several deal boards, hinged together at the corners, so that by exposing to view those boards, the peculiar manner in which they are arranged shall be visible to the telescopic observer at the next station, and shall convey to him a signal, the meaning of which is to be previously agreed upon. The boards are then to be differently arranged,

* The French in the first instance applied the term 'Semaphore' (sign-bearer) to their telegraph.

by which a different signal will be conveyed, and so on. It was Dr. Hooke's fortune to be the first proposer of many contrivances which in subsequent years others followed out. Such was the case with respect to the telegraph, as we shall presently see.

Other contrivances were proposed by Amontons, Mr. Lovell Edgeworth, &c. But we must come down to the year 1793. At that period Chappe erected a telegraph on the roof of the principal pavilion of the Louvre at Paris, in order to convey orders from the Committee of Public Safety to the French army stationed at Lisle. The orders were written out and sent up to the telegraph, the managers of which put the orders into a telegraphic form, by which they were visible to the persons at the second station, situated on Montmartre. At Montmartre the same signals were again repeated, and made visible to the persons at the third station; and so on until the orders reached Lisle, the stations being three or four leagues distant from one another. Three persons were placed at each station: one person with telescopes to observe the distant signal; another to write it down and to give the necessary orders to the third, who worked the machine, in order to convey the information to the adjoining station. Some of the signals used were for words, others for letters. Three signs were made in one minute, so that a whole sentence could be rapidly communicated from station to station. Without going into the intri-

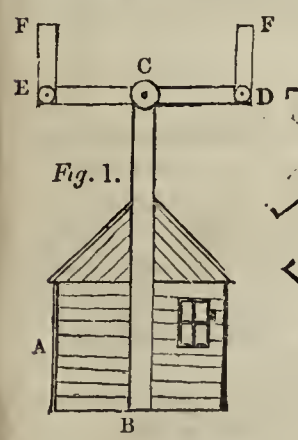


Fig. 1.

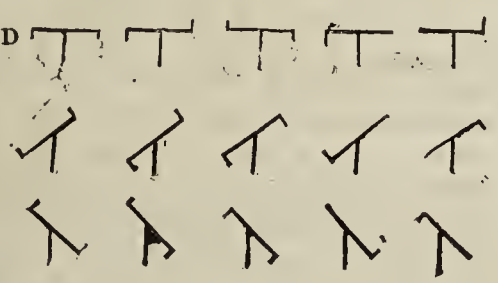


Fig. 2.

cacies of mechanism, the annexed cut may show how different signs were expressed by three planks. Through the middle of a small hut (*fig.* 1, A), which served as an observatory, rose a strong mast or beam, BC, to a considerable height above the roof of the hut. On the top of this was placed a horizontal plank, DE, moving freely round a pivot at C. At the ends were two shorter planks, FF, which moved likewise on pivots at D and E. Several ropes were carried up the mast and made to act severally on the three pivots, so that each one was completely in the power of the persons stationed in the hut below. The object, therefore, was to place the three arms in various relative positions, each position being a symbol for some particular word or letter: *fig.* 2 will convey an idea of some of the very numerous positions into which the machine may be thrown, each pivot being acted on independently of the other two. From the window in the hut, the observer, with a telescope, observed the signals made at the adjoining station. The ropes and other machinery of the telegraph we need not show here.

This contrivance was found to answer so well its intended purpose, that the English Admiralty soon afterwards resolved on adopting a telegraphic communication from London to Deal, Portsmouth, and other towns on the coast. The plan adopted was scarcely so simple as that of Chappe: we shall here described it, and shall represent by a cut the signal-boards, but divested (for the sake of simplicity) of the ropes and other working machinery. On the top of the Admiralty was erected a frame-work, containing six octagonal boards, 1, 2, 3, 4, 5, 6. Each of these boards was movable on a horizontal axis, so as to present sometimes its whole surface, and at other times only its edge, to an observer. *Fig.* 3 (*a*)

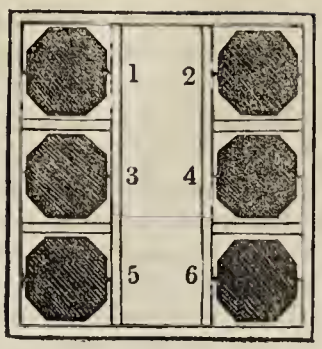


Fig. 3 (*a*).

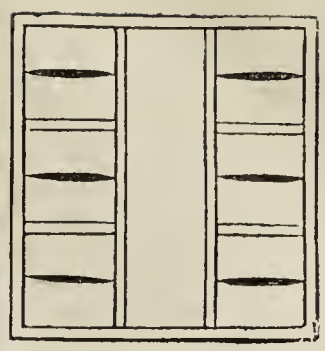


Fig. 3 (*b*).

represents the frame with the surfaces of all the boards presented to view; in *fig.* 3 (*b*) only the edges are visible, the boards having been turned one-quarter round on their axes. Up the central space are arranged the ropes and pulleys for moving the boards. Now the signals conveyed by this telegraph depended on how many, and which, of the six openings were *closed* by the boards. When the machine was not at work, all the ports or doors were open, as in (*b*); when the port (1) was closed by its board or shutter, it signified a certain letter or word; when (2) was closed, it signified a different letter or word; when both (1) and (2) were closed, the meaning was again changed, and so on. It admits of calculation, that the number of different combinations of closed doors, from one to six, capable of being produced, is about sixty; and of this number the Admiralty selected thirty-six of the most convenient, to express the letters of the alphabet, comma, semicolon, the words "attention," "repeat," "error," and one or two others. With this apparatus, many important despatches, commands, &c. were conveyed to and from London during the last war, there being telegraphs at intermediate stations between London and the southern coast.

But this machine was not so convenient as the one by Chappe; it was too ponderous to be elevated to any great height; and moreover the boards were not visible at so great a distance as the planks in the French telegraph, a circumstance which rendered it necessary to have the stations closer together. Accordingly, in 1816, the old telegraph was taken down from the Admiralty, and another on a different principle erected. But some years before this, various changes in the French telegraphs were made; particularly in 1806, when new ones were erected on the whole extent of the French coast. The construction of these was very simple: an upright post was fixed, and to it were attached three arms at equal distances. These arms were capable of turning on a horizontal axis in any direction, by pivots placed at their ends. Each arms was governed by a rope from below, and the various signs were given by the various positions in which the arms were placed; thus, if the arms were all horizontal, one sign was expressed; if two were horizontal, and the other concealed behind the vertical part, another sign was expressed; if all inclined upwards, a third sign; if all inclined downwards, a fourth, and so on. By various combinations of position, 342 distinct and very visible signs could be conveyed.

The telegraph adopted in England in 1816, from the suggestion of Sir Home Popham, is an improvement on the French machine just described. It consists merely of an upright post with two arms; the various positions of these two arms represent the letters of the alphabet, and a few other necessary signs. The great improvements in this form of the machine are these:—1, the arms, when not in use, are entirely enclosed in the hollow vertical part; 2, the communication from beneath, by which the arms are moved, is made by long spindles, terminated with a mechanism of toothed wheels at each end, instead of the ropes and other shrinking materials of the older methods; by this a more vigorous and certain movement is obtained; 3, there are dial-plates at the bottom of the upright post, with indexes or hands, which, by

being connected with the spindles that move the arms, always indicate the precise positions in which the arms are placed, so that by looking at the dials (which are within a small room or observatory) it can be seen what movements are necessary to produce a new sign, the movements being made by two men working winches connected with each arm; 4, the whole machine is moveable on a central pivot, so that the broad surface of the arms can be turned in any direction; whereas in the old method, the boards could only be seen in one direction.

These details will be sufficient to convey to the general reader some idea of the principle on which telegraphs have been generally constructed. But it may be necessary to state, that in these telegraphs the observers at each station must employ telescopes to read the symbols exhibited at the adjoining stations; also, that it must be previously agreed upon at what hour or other appointed time observations shall be made; and lastly, that a vocabulary or dictionary of signs must be well understood by all concerned. But this is not all, the vocabulary is, in war time, frequently changed, in order to prevent the signs from being interpreted by any one not in government service. An instance occurred during the last war, in which some English seamen landed on the French coast, attacked a telegraph, and brought away the symbol-book or vocabulary. This was copied and distributed to the Channel Fleet. The consequence of which was, that many of the most important signals made from one telegraph to another were detected and interpreted by the officers in the English ships. This would not have occurred had the vocabulary been changed after the seizure of one of the signal-books.

Several other ingenious methods for rapid communication have been invented, and some brought into use. Of these we may probably find a future occasion of treating.

JOHN ELWES, THE MISER.

[Continued from No. 504.]

Mr. Elwes, from his father Mr. Meggot, had inherited some property in houses in London, particularly about the Haymarket. To this property he began now to add by building. Great part of Marylebone soon called him her founder. Portland Place and Portman Square, and other structures too numerous to name, rose out of his pocket, and had not Lord North and his American war kindly put a stop to this rage of raising houses, much of the property he then possessed would have been laid out in bricks and mortar. As it was, he became, from *calculation, his own insurer*. In possessions so large, of course it would happen that some of the houses were without a tenant; it was therefore Mr. Elwes's custom whenever he went to London, to occupy any of these premises which might happen to be vacant. He travelled in this manner from street to street, frequently an itinerant for a night's lodging; a couple of beds, a couple of chairs, a table and an old woman, were all his furniture, and with these, whenever a tenant offered, he was but too glad to move at a moment's warning. Of all these moveables, the old woman was the only one that gave him any trouble, for she was afflicted with a lameness that made it difficult to get her about quite so fast as he chose, and then the colds she took were amazing. The scene which terminated her life is not the least singular among the anecdotes recorded of Mr. Elwes. The circumstance was related to me, adds Mr. Topham, by Colonel Timms himself:—Mr. Elwes had come to town in his usual way, and taken up his abode in one of the houses that were empty. Colonel Timms, who wished much to see him, by some accident was informed that his uncle was in London, but then how to find him was the difficulty. He inquired at all the usual places where it was probable he might be heard of, in vain. Not many days afterwards he learnt accidentally that Mr. Elwes had been seen going into an uninhabited house in Great Marlborough Street. This was some clue to Colonel Timms, and he went thither. No *gentleman* however had been seen to enter, but a pot-boy recollected that he had noticed a poor old man opening the stable-door, and locking it after him. Colonel Timms went and knocked loudly at the door, but no one answered. Some of the neighbours said they had also seen such a man enter, so Colonel Timms resolved to have the stable-door opened; a blacksmith was sent for, and they entered the house together. In the lower part of it all was shut and silent, but on ascending the staircase, they heard the moans of a person seemingly in distress. They went to the chamber, and there, upon an old pallet bed lay stretched out, seemingly in death, the figure of Mr. Elwes. For some time he seemed insensible that any one was near him; but on some cordials being administered by a neighbouring apothecary, who was sent for, he recovered enough to say "that he had, he believed, been ill for two or three days, and that there was an old woman in the house, but for some reason or other she had not been near him; that she had been ill herself, but that she had got well, he supposed, and gone away." On repairing to the garrets, they found the old woman stretched out *lifeless* upon the floor. To all appearance she had been dead about two days! With all this penury, Mr. Elwes was not a hard landlord, a fact that redounds in no slight degree to the credit of *such a man*.

The character of an impartial and upright country magistrate is the best character which the country knows. What a lawgiver is to a state, an intelligent magistrate is in a less degree to the district where he resides. Such a magistrate was Mr. Elwes while he resided in Berkshire, and it was almost entirely owing to this best of recommendations, that an offer was made to him afterwards, of bringing him in as a representative for the county. The prospect of a contested election betwixt two most respectable families in Berkshire first suggested the idea of proposing a third person who might be unobjectionable to both. Mr. Elwes was chosen. He agreed to the proposal, as it was further enhanced to him by the understanding that he was to be brought in by the freeholders for nothing. I believe all he did was dining at the ordinary at Abingdon; and he got into parliament for eighteen pence! On being elected member for Berkshire, he left Suffolk and went again to his seat at Marcham. His fox-hounds he carried along with him, but finding his time would in all probability be much employed, he resolved to relinquish his hounds; and they were shortly after given away to some farmers in that neighbourhood. Mr. Elwes was sixty years old when he thus entered on public life. In three successive parliaments he was chosen for Berkshire; and he sat as member of the House of Commons about twelve years. It is to his honour—an honour in those times indeed most rare!—that in every part of his conduct, and in every vote he gave, he proved himself to be what he professed, an independent country gentleman. Wishing for no post, desirous of no rank, wanting no emolument, and being most perfectly conscientious, he stood aloof from all those temptations which have led many good men astray from the paths of honour. He was once unhappy for some days on learning that Lord North intended to apply to the king to make him a peer. I really believe, had such an honour fallen unexpectedly upon his head, it would have been the death of him. He never would have survived the being obliged to keep a carriage and three or four servants—all perhaps better dressed than himself! For some years Mr. Elwes supported the ministry, and I am convinced, adds his biographer, it was his fair and honest belief that the measures of Lord North were right. The support he gave was of the most disinterested kind, for no man was more materially a

sufferer by Lord North's American war than he, in consequence of the deprcciation in the value of his great property in houses which took place. At last however Mr. Elwcs's confidence gave way, and he entered into a regular and systematic opposition with the party of Mr. Fox, which he continued till Lord North was driven from power in March, 1782. When the famous coalition took place, it obtained the support of Mr. Elwes, in conscquence of which he was threatened with a contest at the ensuing dissolution of parliamcnt. The character he had long borne in Berkshire for integrity might have made a re-election not improbable, had he been willing to have submitted to the necessary expense. But that was out of the question—he would have died at the first election dinner! So voluntarily, and without offer of resistance, he retired from public life. During his parliamentary career, it was said of Mr. Elwes, "that no man or party of men could be sure of him;" in itself a decisive proof of his independcnce of character. I say, continues Mr. Topham, what I ought:—I write only that which I am in duty bound to write—when I here set down—that a more faithful, a more industrious, or a more incorruptible representative of a county never entered the doors of the House of Commons. He never asked or received a single favour, and I believe he never gave a vote but he would solemnly have laid his hand upon his breast and said, "So help me God! I believe I am doing what is for the best!"

[To be continued.]

WINCHESTER COLLEGE AND ITS LIBRARY.

[Continued from No. 504.]

The floor of the chapel was, in former times, paved with ornamental stones inlaid with curious brasses; and thc choir stalls were in the ancient style adorned with canopies and spire-work. Bnt the monuments and the stalls have been ejected from the chapel itself, and the stalls ranged in the ante-chapel something after the fashion of antique chairs in the hall of a gentlcman's mansion; and they are also without their canopies and their spires, which have gonc one knows not whither. The monumental stoncs also have been removed into the ante-chapel; but most of the brasses have been torn off or obliterated, though all the inscriptions were copied by Wood the antiquary, and most of them are, we believe, preserved in Warton's description. The cause for which the old stalls and old monuments were ejected from this chapel, was what was then considered as a very great improvement, and highly creditable to the ingenuity of the projectors, at whose expensc it was made; but which has sadly disfigured the place, by destroying the keeping and congruity. The change was made by Dr. Nicholas, in 1681; and he placed modern benches and wainscoting in the room of the stalls, new painted the choir, and had a new altar ercctcd of the Ionic order, so that the roof and walls still appcar those of an ancient chapel, while the floor and furniture would better becomc a modern mecting-house, and the organ is stuck up against the north wall, as if doubtful to which it should belong. Thc appointment of the choir consists of three chaplains, threc clerks, an organist, and sixteen choristers; and the choir service is performed at 8 o'clock and 5 o'clock on Sundays and holidays, and 5 o'clock on thc vigils of the latter. In vacation time strangers may attend the chapel; and there are tribunes for females in the places formerly occupied by thc side altars.

In formcr times, a door led from the chapel to the cloisters; but that is now closed up, and the entrance to the cloisters is become what may be called the third court. These cloisters constitute the extreme south-east of the College buildings, and form a square of 132 feet on the side. These cloisters are very neat, but evidcntly of much more modern date than the time of Wykeham. It is probablc that they were built during the wardenship of Thurburn, and about the year 1430, by John Fromond, who certainly in that year built the chapel which occupics the centre of their area. It is not improbable that this Fromond may have becn acquainted with and under obligations to Wykeham, from his liberality to both Wykeham's colleges. But he was in secular employment, and not a churchman, for whilc he gave annual gowns to the choristers, his wife Maud gave two cups to the College, and this not for sacerdotal purposes, as appears from thc following inscription said to have been upon one of them:—

> "He shall have Chryste's blessing to his dell,
> Whoso of me drinketh well;"

from which it would appear that this good lady encouraged the cstablishment in their potations.

When Fromond built this chapel, he endowed a priest to officiate in it, and furnished apartments for him in the north-wcstern part of the College. But this endowment, being within the statute at the time of the dissolution, was abolished, and thc chapel became part of thc College. What use was made of it at first has not been said, but in the last year of the wardenship of Nicholas Love, that is, in 1629, it was converted into a library, and so remains to the present time. The collection of books is considerable, and somc of them are of great value; and there are also a few articles such as are suitable for a museum; but upon the whole it is not greatly worthy of attention, and does not appear to have much effect upon the knowledge of the inmates of the College. Still it is a handsome building, very neatly fitted up, and kept in good order. To thc westward of the cloisters and library, and separated from them by an area of moderate dimcnsions, stands the building which is, in a public point of view, the most interesting of the whole. This is the public school, a plain substantial building erected in the year 1687, at a cost of 2600*l*., obtained chiefly by a subscription amongst Wykehamists, who have at all times been forward in contributing to the improvement of the place of their education. Over the entrance there is a bronze statue of the founder, modelled, cast, and presented by Caius Gabriel Cibber, who was as famous as a statuary, as his son Colly Cibber was notorious as player, poet-laureate, and hero of the 'Dunciad.' His statues of Melancholy and Raving Madness, which long stood over the gatc of old Bethlehem, were always reckoncd among the *chefs d'œuvre* of modern art. The statuc in question is a good one, but has been disfigured by being paintcd and gilt. The inscription is in these words, only in Latin: "Sacred to the memory of William of Wykeham, bishop of Winchester, founder of this College. Caius Gabriel Cibber, statuary to the king, and a relation, by his wife, of the aforesaid founder, caused this brazen statue of him to be cast and erected here at his own expense." This school-room is spacious, being 90 feet long, 36 feet wide, and of proportional height: upon the walls are set forth the admonitions and rules for the government of thc scholars, all in Latin; but we shall give the English translations, as some of them are a little curious, and all of them sensible.

The admonitions are three: "Either learn; or dcpart; or in the third place be flogged;" and adjoining to these there are appropriate symbols. The mitre and crozier to the first, as the probable rewards of learning; an inkhorn and sword to thc second, to order and enforce expulsion; and a scourgc to the third, as the only instrument that can speak to thc feelings of a dunce. Thc regulations we shall quotc at length.

Table of Scholastic Laws.

"*In the Church.*—Worship God. Say your prayers with a pious affection of the mind. Let not your eyes wander about. Keep silence. Read nothing profane.

"*In the School.*—Let each one be diligent in his studies.

Let him repeat his lesson in a low tone of voice to himself, but in a clear tone to his master. Let no one give disturbance to his neighbour. Take care to spell your theme right. Have all your school implements in constant readiness.

"*In the Hall.*—Whoever says Grace, let him repeat it distinctly. The rest are all to answer to him. All are in the meantime to stand upright in their places. Whatever is to be repeated, let it be clearly and properly pronounced. Whilst you sit at table, behave with due decorum.

"*In the Court.*—Let no one throw stones or balls against the windows. Let not the building be defaced with writing or carving upon it. Let no one approach the masters with his head covered or without a companion.

"*In the Chambers.*—Let cleanliness be attended to. Let each one study in the evening, and let silence prevail in the night.

"*In the Town, going to the Hill.*—Let the scholars walk in pairs. Let them behave with proper modesty. Let them move their hats to their masters and other respectable persons. Let decency regulate your countenance, your motions, and your gait. Let no one on the hill go beyond the prescribed limits.

"*Everywhere and at all times.*—Let inferiors be subject to the preposters. Let the preposters govern with equity. Let the latter be themselves free from fault and give good example to the rest. Let both inferiors and preposters refrain from everything that is unbecoming, both in actions and in words.

"Whoever disobeys these rules, upon conviction will be sentenced to condign punishment.

"None will be excused in staying at home beyond the time of the vacation. Those who are detected in going out of the College without leave will be expelled for the third offence."

It must be admitted that these rules are admirable; and we believe they are strictly observed both by the foundation scholars and the gentlemen commoners. They are indeed worthy of transcription into all other public schools, and we believe that obedience to them is so general, that there have been fewer revolts, disturbances, barrings out, and other insubordinations at Winchester College than at any other public school in the kingdom.

The commoners, not being under the control of the warden, and paying for all that they receive, have the privilege of the school-room and the tuition only within the College. They are under the immediate superintendance of the head master, and have a quadrangle and a hall of their own, situated at the north-western angle of the College, and under the immediate observation of the head master. At the present time this quadrangle, which is College property as well as the rest, is in progress of rebuilding in very splendid style; and until it is rebuilt suitable abodes are hired for the head master and the commoners. The foundation scholars are, by the foundation, limited to seventy, and the commoners are in general about a hundred and thirty, making in all about two hundred young gentlemen constantly receiving education at this establishment.

To get on the foundation, interest is of course required; and the Warden and Fellows here, and those of Wykeham's College, Oxford, are the parties with whom interest is to be made. For commoners it is only required that they shall be respectable and of good moral habits, and their parents competent to the payment of the fees, which are of course considerable. The common scholars wear no gown or other distinction of dress; but the prefects, or preposters, wear black gowns, and caps with a square top. These last are appointed for their talents alone, and are often not half the size of the young men of whom they have the direction.

As the original intention of this school was to prepare students for Wykeham's new College at Oxford, this purpose is still kept up; and the elections are made previous to the summer vacation. At this time, the Warden and Fellows of the New College, or such portion of them as may be named for the purpose, repair to Winchester; and there, with the Warden, Sub-Wardens, Head Master, and other Fellows of that College, form a court of examination for those qualified for the College. The candidates consist of two of the kin of the founder, if such are found qualified, and after them of the other foundation scholars in the order of their respective merits. While at the school here the total expense to gentlemen commoners, may be about a hundred and twenty pounds a year, and perhaps the extras not included in the foundation may cost the foundation-scholars some thirty or forty. There is no limitation as to the age at which foundation-scholars may enter the establishment; but if they are not of the kindred of the founder, they must leave it at eighteen, whereas his kindred may remain till they are five and twenty. After the candidates for Oxford have been selected and all the business is over, there is a ball, and the final act previous to the summer vacation is the chanting of a Latin song, "Dulce Domum," to which justice cannot be done in any English translation.

Sagacity of Ants.—In the swampy regions of Xarayes, in La Plata, where the inundation of the Paraguay commences, the ants, which are in vast numbers there, have the sagacity to build their nests in the tops of the trees, far out of reach of the waters; and these nests are made of a kind of adhesive clay, so hard that no cement can be more durable or impervious to the weather.—*Sir Woodbine Parish's Buenos Ayres and La Plata.*

Mode of Sticking Peas.—The following mode of sticking peas, and especially the taller varieties, is both cheap and simple, and possesses many advantages. Procure a number of strong thick stakes or thin poles, in length according to the height of the peas, from five to ten feet, and drive them into the ground on each side of the row, at the distance of three or four yards; pass a small line along the poles, taking a turn on each within a few inches of the ground, and as the peas advance, raise the next turn a little higher, and so on in succession, till they have attained their full height. Sew the tendrils of the peas and truss them round these lines, by which they will be supported in a better manner than by the common method of sticking. When spread regularly along the lines, they have a fine circulation of air, and pods can be pulled at all times without injuring the haulm, and as the birds have no twigs to alight on, the portion of the crop which they otherwise would devour and destroy is saved. An excellent way to preserve peas or beans from mice is to chop up the tops of the last year's shoots of furze, and sow them in drills; the author has known it to have been an effectual remedy in several instances, where these mischievous little animals had been very prevalent.—*Vegetable Cultivator, by John Rogers.*

Slave-like Notions on the Institution of Property.—When we hear men speaking against the institution of property, what is it but a slave's language? A slave can neither acquire nor alienate,—he has and can have no property; the notion of property is essentially foreign to his condition;—but to freemen it is one of the highest conditions of humanity that men can not only possess what they eat and drink and wear,—which the beasts can do no less,—but that they can lay by, improve and increase, give and even bequeath certain portions of the earth, or of the things upon it, portions taken by industry and preserved by law from being subject to the wasteful scramble of ignorance and force. An institution so sacred, and so essential to the elevation of our nature, is, and ever has been, deeply valued by all freemen. Slaves have no share in it, and no perception of it; and they who speak of it slightly proclaim themselves to be as slaves.

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ALGERIA.

[Costantina.]

[Continued from No. 501.]

COSTANTINA (pronounced Costantineh by the Arabs, and frequently printed Constantine in the English newspapers) ranks next in importance to Algier, the capital. Under the name of Cirta it was once the capital of Numidia, and the ruins of its ancient aqueducts are still in existence. Costantina occupies a bold and commanding situation on a steep rocky hill, with the river Rummel flowing on three sides of its base. The country around is a high terrace between the chains of the maritime and central Atlas. It is forty-eight miles distant from the sea, one hundred from Bona, and two hundred from Algier; but the communication with each of these places is rendered difficult by mountain-passes. The 'Iron Gates' is a pass cut through perpendicular rocks on the road to Algier; and six miles east of Costantineh is another pass called the 'Ascent,' which is carried along a narrow ridge with precipices on each side. Gelma is a strong position half-way between Costantineh and Bona, commanding the entrance of the plain of Costantina. In November, 1836, an expedition was undertaken against Costantina by Marshal Clausel at the head of 8000 men. They marched from Bona by the left bank of the Seiboos, and experienced great difficulties in crossing the swollen torrents and in conveying their cannon over the lesser Atlas. At length, when they arrived on the high terrace of Costantina, a heavy fall of snow which lasted several days, and the severe cold, killed or disabled a great part of the army; and on reaching the city, it was found too strongly defended to be carried without a regular siege, for which the French were not prepared. They were therefore compelled to retreat, the Arabs severely harassing their rear-guard. A great blunder had in fact been committed in commencing operations so late in the season. In the following year a new expedition was prepared, and on the 13th of October, General Damremont, the commander-in-chief of the French troops in Africa, attacked Costantina, and carried it by assault after a desperate resistance on the part of the native troops and inhabitants. Damremont was killed by a cannon-shot, and Achmet Bey retired with 12,000 men as the French entered the city.

The Bey of Costantina was the most powerful of the three Beys among whom the territory of Algier was divided, the Beylik occupying nearly one-half of the regency. Costantina was an important acquisition to the French, as it gave them a footing in the interior. The country around is well adapted for agriculture on a large scale; but then colonists are wanting, and until security and order are established, it is almost vain to expect that persons of capital should adventure their fortunes in this part of Algeria. There might be objections to employing the troops for some portion of their time in the cultivation of the soil, from the effect which it might have in impairing their military discipline and efficiency; but the high price which France is paying for her possessions in Africa, amounting probably to nearly two millions sterling a year, is so serious a drain of her resources, as to

render any plan deserving of consideration which promises to lessen this enormous cost. The struggle between pride and frugality cannot but be a painful one; and it is to be lamented that hitherto the colony has proved so unproductive, that the opinion in favour of retaining possession of Algeria has flowed rather from the former principle. There is no chance of the natives ever expelling the French from North Africa by force; and the utmost they can do is to prolong the period of its unprofitableness as a colony. Indeed, under the most favourable circumstances, the expenses of the military occupation must for a great length of time exceed any profits which may be realised; but in time the tobacco plant, the olive and the vine, and the silk-worm may possibly become sources of wealth to the French, who are already accustomed to cultivate these productions, and know how to turn them to the best account. As to the possession of Algeria creating any jealousy amongst well informed persons in this country, we venture to say that while they regret that property has been unjustly sequestrated, and many heart-rending and deplorable acts of injustice been committed, they would rejoice to see Algeria prospering, and French colonists carrying into Africa the arts and sciences which diminish barbarism. Some good has been already achieved, and the amelioration of the former cruel judicial system is a most important step. Moreover, the social condition under which the natives lived was not one which we should wish to see unchanged. The poet Campbell, who visited Algiers in 1835, says, "The native population, though it will sometimes show you heads and forms worthy of a scriptural picture, exhibits incomparably more numerous objects of such wretchedness as you would not meet with in a European city; elephantiasis and blindness are excessively common, and disease and poverty may be said to walk the streets." But whatever evils may have ensued from the French occupation, there can be little doubt that they are far less than those which would desolate the regency if they were to abandon the colony. The King of the French put a question to the English poet which concentrates the case so far as the interests of humanity are concerned. "To whom would the Algerine territory be given back?" "The Turks?" asks Mr. Campbell. "They would immediately be at war with the Moors for superiority; and both Moors and Turks would join in oppressing the Jews. Then the Arabs would assert their independence, and there would be a universal civil war. Nay, it is doubtful with me," he adds, "whether, in the event of the French relinquishing Algiers, and even blowing up their forts and arsenals, the Algerines would not again rebuild their private vessels and re-act their cruelties on Christian captives."

M. Blanqui recommends, as one of the means by which the prosperity of the regency might be accelerated, that Algier, Bona, and Oran should be made free ports. The manufacturers of Rouen and other places in the mother country must not be allowed to regard Africa as a market for their goods, to be monopolized by the aid of heavy protecting duties. The imports of Algeria in 1838 amounted to 1,300,000*l.*, on which the duty amounted to 40,000*l.*, thus augmenting the value of capital, which is so scarce in the colony, diminishing competition, and keeping up prices to their present enormous rate. Cattle and flour were imported to the value of 360,000*l.* The customs' duties are all absorbed in the expenses of collection, so that no loss would ensue in throwing open Algeria to the commerce of the world. The wines of Provence are the chief French productions which are consumed in Algeria. The consumption in 1838 amounted to 260,000*l.*; and since 1833, though the European population has only doubled, the quantity of wine consumed is quintupled.

JOHN ELWES, THE MISER.

[Concluded from No. 505.]

WHEN Mr. Elwes, on his first election, thought he had got into the House for nothing, he had not taken into account the inside of the house. In a short time however he found out that members of parliament could want money, and he had the misfortune to be the one member who was inclined to lend to them. There existed after his death a pile of bad debts and uncalled bonds, which, could they have been laid on the table of the House of Commons, would have struck dumb some orators on both sides of the house. Time, which conquers all things, conquered this passion of lending in Mr. Elwes, and an unfortunate proposal which was made to him of vesting 25,000*l.* in some iron-works in America, gave at last a finishing blow to his various speculations. The plan had been so plausibly laid before him, that he had not a doubt of its success, but he never heard any more either of his iron or his gold. From that time he vested his money in the funds. During his attendance in parliament he invariably walked home at the close of the debates, however inclement the weather, unless some member took him up in his way. One very dark night, as he was hurrying along, he went with such violence against the pole of a sedan chair, that he cut his legs very deeply. As usual, he thought not of any assistance; but Colonel Timms, at whose house he then was, in Orchard Street, insisted on some one being sent for. Old Elwes at length submitted, and an apothecary was called in, who immediately began to expatiate on the bad consequences of breaking the skin—the good fortune of his being sent for—and the peculiarly bad appearance of the wound. "Very probably," said the old man, "but, Mr. ———, I have one thing to say to you—in my opinion my legs are not much hurt; now you think they are; so I will make this agreement—I will take one leg, and you the other; you shall do what you please with your's, and I will do nothing to mine; and I will wager your bill that *my* leg gets well first." I have frequently heard him mention, with great triumph, that he beat the apothecary by a fortnight. On the subject of the manners of Mr. Elwes, gladly I speak of them with the praise that is their due. They were such—so gentle, so attentive, so gentlemanly, and so engaging, that rudeness could not ruffle them, nor strong ingratitude break their observance. He retained this peculiar feature of the old court to the last; but he had a praise far beyond this, he had the most gallant disregard of his own person and all care about himself, I ever witnessed in man. At the time he was seventy-three, he went out shooting with me, to see whether a pointer, I at that time valued much, was as good a dog as some he had had in the time of Sir Harvey. After walking for some hours much unfatigued, he determined against the dog, but with all due ceremony. A gentleman who was out with us, and who was a very indifferent shot, by firing at random lodged two pellets in the cheek of Mr. Elwes, who stood by me at the time. The blood appeared, and the shot certainly gave him pain; but when the gentleman came to make his apology and profess his sorrow, "My dear Sir," said the old man, "I give you joy on your improvement. I knew you would hit something by and bye." When he retired from parliament he was nearly seventy-five years of age. The expenditure of a few hundred pounds would probably have continued him in the situation he loved, where he was respected and had due honour; where he was amongst his friends, and where long habit had made everything congenial to him. All this he gave up for the love of money. That passion, consuming all before it, at length carried him untimely to the grave. When Doctor Wall, his last physician, was called in, and viewed him extended on the squalid bed of poverty from which he would not be relieved, he said to one of his

sons, "Sir, your father might have lived these twenty years; but the irritations of his temper have made it impossible to hope for anything; the body is yet strong, but the mind is gone entirely." The scenes that now wait upon my hand, for the few years before his death, will exhibit a story of penurious denial that never have fallen to my share to find a parallel. In the wonder which they have yet left upon my mind, I can only say "They are true!"

Mr. Elwes had for some years been a member of a card club at the Mount Coffee-house, and here he for a time consoled himself, by constant attendance, for the loss of parliament. He still retained some fondness for play, and imagined he had no small skill at picquet. It was his ill luck however to meet with a gentleman who thought the same, and on much better grounds; for after a contest of two days and a night, Mr. Elwes rose a loser of a sum which he always endeavoured to conceal —though I have some reason to think it was not less than 3000*l*. This was the last folly of the kind of which he was ever guilty. At the close of the spring of 1785, he wished again to visit his seat at Stoke. But the famous old servant was dead, all the horses that remained with him were a couple of worn-out brood-mares, and he himself was not in that vigour of body in which he could ride sixty or seventy miles on the sustenance of two boiled eggs. The mention of a post-chaise would have been a crime—"*He* afford a *post-chaise* indeed! where was he to get the money?" would have been his exclamation. At length he was carried into the country free of expense by a gentleman. When he reached his seat at Stoke, the past scene of something resembling hospitality, and where his fox-hounds had spread vivacity around, he remarked he "had expended a great deal of money once very foolishly; but that a man grew wiser by time." Here, during the harvest, he would amuse himself with going into the fields to glean corn on the grounds of his own tenants; and they used to leave a little more than common to please the old gentleman, who was as eager after it as any pauper in the parish. That very strong appetite which Mr. Elwes had in some measure restrained during the long sittings of parliament (where he had accustomed himself to fast sometimes for twenty-four hours in continuance), he now indulged most voraciously, and on everything he could find. Game in the last stage of putrefaction, and meat that walked about his plate, would he continue to eat rather than have new things killed before the old provisions were finished. With this diet—the charnel-house of sustenance—his dress kept pace, equally in the last stage of dissolution. It is the lot of some men to outlive themselves; such was now the case of Mr. Elwes. When he first visited Suffolk, his peculiarities were but little known, and when he came to reside there, his fox-hounds "covered a multitude of sins."

In leaving that county to become a member of parliament, his public conduct could not but be praised, and in his private character that which was not seen could not be blamed. But on his return, when he exposed to continued observation all his penury, when his tenants saw in his appearance or style of living everything that was inferior to their own—when his neighbours at best could but smile at his infirmities—and his very servants grew ashamed of the meanness of their master—all that approached respect formerly was now gone; and a gentleman one day inquiring which was the house of Mr. Elwes, was told somewhat facetiously by one of the tenants, "The poor-house of the parish!"

The spring of 1786 Mr. Elwes passed alone, and had it not been for some little daily scheme of avarice, would have passed it without one consolatory moment. His temper began to give way apace; his thoughts unceasingly ran upon money! money! money! and he saw no one but whom he imagined was deceiving and defrauding him. On removing from Stoke he went to his farm-house at Thaydon Hall, a scene of more ruin and desolation, if possible, than either his houses in Suffolk or Berkshire. It stood alone on the borders of Epping Forest; and an old man and woman, his tenants, were the only persons with whom he could hold any converse. Here he fell ill, and as he would have no assistance, and had not even a servant, he lay unattended and almost forgotten for nearly a fortnight. He now determined to make his will, which he did shortly afterwards in London, leaving the whole of his unentailed property to his sons, George Elwes, then living at Marcham, and John Elwes, "late a lieutenant in his Majesty's second troop of horse-guards," then residing at Stoke. The property thus disposed of was judged to amount to about 500,000*l*. Mr. George Elwes, being now married, was naturally desirous that, in the assiduities of his wife, his father might at length find a comfortable home. The old man was induced to agree to the proposal, being offered a gratuitous conveyance. Mr. Elwes carried with him into Berkshire five guineas and a half, and half-a-crown, which he had carefully wrapped up in various folds of paper. Mr. George Elwes and his wife, whose good temper might well be expected to charm away the irritations of avarice and age, did everything they could to make the country a scene of quiet to him. But "he had that within" which baffled every effort of the kind. Of his heart it might be said that "there was no peace in Israel." His mind, cast away on the vast and troubled ocean of his property, extending beyond the bounds of calculation, returned to amuse itself with fetching and carrying about a few guineas! The first symptoms of more immediate decay was his inability to enjoy his rest at night. Frequently would he be heard at midnight as if struggling with some one in his chamber, and crying out, "I will keep my money, I will; nobody shall rob me of my property."

Mr. Partis, the gentleman who on this occasion took him down gratuitously into Berkshire, and was staying awhile in the house, was waked one morning about two o'clock by the noise of a naked foot, seemingly walking about his bed-chamber with great caution. Somewhat alarmed, he naturally asked, "Who is there?" on which a person coming up towards the bed, said with great civility, "Sir, my name is Elwes; I have been unfortunate enough to be robbed in this house, which I believe is mine, of all the money I have in the world—*of five guineas and a half, and half-a-crown.*" The unfortunate man was found a few days after in a corner behind the window-shutter. For some weeks previous to his death he had got a custom of going to rest in his clothes. He was one morning found fast asleep betwixt the sheets, with his shoes on his feet, his stick in his hand, and an old torn hat upon his head. On the 18th of November, 1789, he discovered signs of that utter and total weakness which in eight days carried him to the grave. On the evening of the first day he was conveyed to bed—from which he rose no more. His appetite was gone—he had but a faint recollection of anything about him; and his last coherent words were addressed to his son, Mr. John Elwes, in hoping "he had left him what he wished." On the morning of the 26th of November, he expired without a sigh! with the ease with which an infant goes to sleep on the breast of its mother, worn out with "the rattles and the toys" of a long day.

We cannot better conclude this notice of Mr. Elwes than with the following extract from Mr. Topham's summary of his character. In one word, he says, his public conduct lives after him, pure and without a stain. In private life he was chiefly an enemy to himself. To others he lent much; to himself he denied everything. *But in the pursuit of his property, or in the recovery of it, I have not in my remembrance one unkind thing that ever was done by him.*

HORSE ARMOURY IN THE TOWER.—III. HENRY VI.

[Henry VI.—A.D. 1450.]

CONSIDERED as a chronological series, the Armour in the Tower may be said to commence with the figure of Henry VI., habited in armour of the middle of the fifteenth century, there being no complete suits of armour of an earlier date in the collection, with the exception of those we have already given of the times of Stephen and Edward I. As we have not hitherto said much respecting the fashion of arms and armour in different ages, we may now enter a little into the history of military costume in England, and endeavour to point out the variations and improvements which have gradually taken place.

With regard to this subject we need not revert to an earlier period of English history than the ninth or tenth century, when the Anglo-Saxons were perpetually engaged in contests with the Danes. It was not until the repeated successes of the Danes in their incursions on the country had proved the utility of the iron garments with which they were habited, that the Anglo-Saxons adopted a similar costume as a protection against the weapons of their enemies. Previously they had worn in battle the same vestments in which they were habited in their most peaceful moments, a shield being almost the only addition made on such an occasion to their ordinary attire. They were always armed with either a spear or a sword, but preferred a light dress in the form of a short linen tunic to stronger and more protective garments, as they could then more freely wield their weapons; this tunic, however, had sometimes a kind of pectoral, or iron collar, forming a guard round the neck. But when the advantages which the Danes derived from the armour or ringed mail in which they were clad, became apparent in their encounters with the Anglo-Saxons, the latter no longer hesitated to sacrifice something of their activity to gain the protection of an iron coat. We may therefore refer the adoption of iron armour by the Anglo-Saxons to the tenth century, the poems of which period frequently allude to it, as "the battle-mail by hard hands well locked," "the shining iron rings," "the mailed host of weaponed men," &c.

Their helmets or head-dresses consisted generally of leathern caps of a conical form, or of the shape of the ancient Phrygian bonnet, sometimes bound or bordered with metal, and occasionally (if we may judge from the rude drawings of that early time—our principal authorities) made wholly of iron or brass. They carried shields of leather with an iron boss in the centre, holding them at arm's length; and were also armed with long broad double-edged swords, daggers, javelins, and long spears, as well as axes with long handles called bills, a name which has descended almost to the present times.

The armour of the Anglo-Danes was similar to that of the Saxons. By the laws of Gula, said to have been established by Hacon the Good, who died in 963, we find that the possessor of 60 marks, besides his clothes, was required to furnish himself with a red shield of two boards in thickness, a spear, and an axe or a sword. He who was worth twelve marks in addition to the above, was ordered to procure a steel cap; whilst he who was richer by eighteen marks was obliged to have a double red shield, a helmet, a coat of mail, or a *panzar* (which was a tunic of quilted linen or cloth), and all

usual military weapons.* The Danish shields were either round or of a crescent shape, mostly coloured red, but frequently adorned with fanciful devices and enriched with gilding. Their weapons were the spear, sword, bow, and a double-bladed axe, in the use of which they were very expert.

When the Saxons re-assumed the government of England for the short period preceding the Norman Conquest, they very generally adopted the habits of the Danes, whom they had superseded; but there was one remarkable circumstance with respect to the defensive clothing of the soldiers which deserves to be noticed here. When Harold was engaged in the pursuit of the Welsh, he found the heavy armour of the Saxons (the tunic covered with iron rings) so much impede the movements of his soldiers, that he ordered them to use armour made of leather only. This armour consisted of a number of pieces of leather cut in the shape of leaves, which overlapped each other over the whole dress, presenting an appearance similar to the oriental scale-armour. This scaly leathern armour seems to have been used by the Normans of that period, and to have been occasionally worn by them as late as the thirteenth century, the leaves or scales being sometimes painted of different colours.

We now come to speak of the military dress of the Normans as worn by them on the conquest of England by William the First. One of the best authorities for the costume of this period is the celebrated Bayeux tapestry, in which the dresses of both Normans and Saxons are very plainly delineated; and we shall find that a considerable difference existed in the military habits of the two nations. The Norman warriors are there represented not only in ringed tunics or coats of mail, but with a *capuchon*, or cowl, of the same material, placed over the head and shoulders. Over this is placed a conical helmet with a nasal-piece, and, in some cases, a neck-piece behind.

The tunic was cut up a little way before and behind for the convenience of riding, and was called by the Normans the hauberk, by which name it has been rendered familiar to most readers of the tales of chivalry and romance. A new species of hauberk was introduced at the commencement of the eleventh century, having lozenge-shaped pieces of steel fastened to the tunic instead of rings. This obtained the name of mascled armour, from its resemblance to the meshes of a net. Frequently the rings and mascles were introduced in the same suit.

Another distinguishing feature in the Norman armour was made by the addition of chaussés, or leg-pieces, of the same material as the hauberk, which, covering the whole of the leg, rendered the equipment complete. The collar of the hauberk was occasionally drawn up over the chin and attached to the nasal, a practice which became very general some few years after. The shields worn by the Normans were peculiar, being of a long kite shape, and having, besides two bands for the hands, a strap for the purpose of attaching it to the neck, so that both hands might be at liberty when occasion required it. These shields were frequently ornamented with fanciful devices, but regular heraldic bearings were the invention of a later age. The lances of the knights were decorated with small flags or streamers, and were designated gonfanons or gonfalons.

The costume we have now described, of the time of the Conquest, continued, with little variation, to the close of the twelfth century. It may be seen in the figure of the Norman Crusader at the head of No. I. of the present series, copied from the figure in the Tower.

In the reign of Henry I. the custom of hooking up the collar of the hauberk to the nasal was very common, and was followed up about that time by the introduction of steel cheek-pieces, either pendant to the sides of the helmet, in addition to the neck-piece behind, or worn beneath like a half-mask, with apertures for the eyes. These cheek-pieces were called by the Normans *aventailles* (*avant-tailles*), a term which afterwards came to be applied to the *visor*, a later invention. The *chapel-de-fer* and the *coif-de-fer* were iron caps used in this reign, the former being worn over the cowl of the hauberk, the latter beneath it.

During the reigns of Richard I. and John some important additions were made to the armour and the dress of the military. The helmet, which had been hitherto worn of a conical shape, now became flat-topped, had a hoop of iron passing under the chin, and was provided with a moveable grating, called, like the cheek-pieces we have before noticed, an aventaille, affixed to a hinge on one side and fastened by a pin on the other, so that it opened like a wicket and might be taken off or put on as occasion required. Beneath the hauberk, or coat of mail, a long tunic was worn, descending to the feet, and over the hauberk the surcoat. The custom of wearing the latter appears to have originated with the Crusaders, who are said to have adopted it to prevent the armour becoming heated by the direct rays of an Eastern sun.

Those who were unable to afford hauberks clad themselves in either the *wambeys* (or *gambeson*), or the *haqueton*, both wadded or quilted tunics; the first, according to Sir S. Meyrick, being of leather stuffed with wool, and the second of buckskin filled with cotton. These were also occasionally worn with the hauberk being placed beneath it. Besides these defences another was introduced, called a plastron-de-fer, or steel plate, which, being worn either under the gambeson or between it and the hauberk, prevented the latter from pressing on the chest. Yet even these multiplied defences were sometimes found barely sufficient to protect their wearers from the violence of a spear-thrust. In a combat between Richard Cœur-de-Lion, then Earl of Poitou, and a knight named William de Barris, they charged each other so furiously that their lances pierced through their shields, hauberks, and gambesons, and were only prevented by the plastrons from transfixing their bodies. The plastron became afterwards distinguished by the name of *gorget* or *haubergeon*.

The shields of this period were smaller than those previously used, and approached more to a triangular shape, but of a semi-cylindrical form, being curved round the arm: they were ornamented with heraldic bearings and fanciful devices.

To the ordinary weapons, the spear, battle-axe, sword, and bow, there was now added the arbalestc, or cross-bow, which continued in use till the introduction of musketry.

In the reign of Henry III. several alterations were effected in the armour and other costume of the military. The surcoat was then first emblazoned with armorial bearings; the flat-ringed armour became almost entirely superseded by armour composed of rings set edgewise, so as to afford more strength; and this was again eclipsed by the *chain-mail* (imported from Asia), which was so constructed that it formed a garment of itself, without the necessity of having a leathern foundation, which the other species of ringed-mail required. But the most important additions to the armour made at this period consisted in the application of plates of iron or steel to the shoulders, elbows, and knees, paving the way for the introduction of the plate-armour, which in the fourteenth century composed the whole suit. The form of the helmet underwent various changes, but the most usual was that of a truncated cone on the top of a cylinder, the fore part being furnished with visors, or aventailles, pierced for the sight and for the breath in the form of a cross or with a multitude of small holes. Henry also introduced the rowelled spur, but it was not until

* See 'British Costume—Library of Entertaining Knowledge.'

the next reign that it became common, the spurs in general remaining pointed or lance-shaped.

The chanfron, or armour for the horse's head and face, was also introduced at this period, but it does not appear to have been very generally employed.

During the reigns of the three Edwards considerable alterations were made in the military costume. In the reign of Edward I., the surcoat was almost always emblazoned with heraldic bearings or designs, at the fancy of the wearer, illuminations of the period being rich in illustrations of the practice.

The helmet was worn of a shape resembling a barrel or approaching a globular form, with laces in front to admit air and permit the wearer to see his foes. This was often surmounted by the heraldic crest, imparting to it an elegant appearance, but it did not supersede the chapels-de-fer until the next reign, when they almost totally disappeared. The *falchion*, a peculiarly shaped broad-bladed sword; the *estoc*, a small stabbing sword; the *anelas*, a broad dagger tapering to a fine point, and the *coutel* or *cultelas* (whence *cutlass*), a military knife, were all added about this time to the weapons already enumerated; and to this list may also be added the *mace*. Towards the close of the reign those curious ornaments called *ailettes*, or little wings, portions of armour affixed to the shoulders and ornamented with devices, were introduced, but it was in the next reign that they became most common.

[To be continued.]

CULTIVATION OF THE TEA-PLANT IN ASSAM.—No. II.

[Concluded from No. 505.]

On the 15th of March, 1834, the Tea Committee made a Report, in which they expressed their opinion that there were districts within the territories of the East India Company which contained a soil and climate suitable to the cultivation of tea, but, though confidently recommending the experiment, the Committee acknowledged that they did not possess information sufficiently specific to enable them to point out the best situations for a favourable trial. The Tea Committee had under its notice at this time a valuable communication, dated February 22, from Dr. Falconer, of the botanical garden, Saharunpore, which contained well-founded grounds for the following conclusions:—1, That the tea-plant may be successfully cultivated in India. 2, That this can be expected nowhere in the plains from 30° north down to Calcutta. 3, That in the Himalaya mountains, near the parallel of 30° north, a climate may be found similar in respect of temperature to the tea districts in China.

The favourable opinions of Dr. Falconer probably induced the Tea Committee to despatch Mr. Gordon, one of their members, to China in the month of June, for the purpose of procuring plants and seeds of the tea-tree, and engaging Chinese cultivators and tea-makers. In July, preparations were commenced for establishing several small nurseries in the north-western mountainous provinces of India, in which the expected supply of seeds and plants from China might be sown and reared; Dr. Falconer having proceeded, at the request of the Committee, to the northward of Saharunpore, to select sites for the nurseries in the Gurwhal and Sirinone hills. The Committee also addressed a letter to the commissioner in Kumaon, requesting him to select five or six sites for nurseries within that province; and as the plants might arrive in a tender and delicate state, it was suggested that the situation of some of the nurseries should be at a comparatively low elevation, gradually ascending to that height where the plants might permanently thrive best. These parts of India contain situations corresponding in climate, soil, and aspect with the tea districts of China and Japan. They constitute the western and northern corners of Hindustan, and are situated within 28° and 31° north latitude, and 76° and 81° east longitude, and extend from the plains of the adjoining provinces to beyond the Himalaya mountains. In this region, which is well watered by numerous rivers and streams, every variety of temperature and soil is to be found. Its flora is, in some instances, identical with that of China and Japan; and the attention of the Committee could not have been directed to a quarter which afforded so strong a likelihood of success, the great obstacle having hitherto been the difficulty of finding a congenial soil and climate.

In November, Mr. Gordon shipped off from China one hogshead, one quarter-cask, and one small case of seeds of the Bohea tea-plant. They were packed in barrels in dry sand with the utmost care, as the thinness of the shell covering the seed and the moist and oily nature of the kernel render it easily susceptible of injury. The seeds reached Calcutta in January, 1835, and at the proper season were put into the ground. A portion of the supply was sent to Madras, and seeds were distributed for the purpose of being sown in the province of Mysore and in the Neilgherry hills. Early in the following year, the plants, then about six inches in height, were taken out of the botanic garden at Calcutta and put into pots, for the purpose of being conveyed to the Muttuck country, a district watered by the Brahmapootra and its affluents. Out of twenty thousand plants which had been sent from Calcutta, only eight thousand survived; but the difficulties attending the conveyance of delicate plants for so great a distance being considered, the loss of three-fifths was not more than could reasonably have been expected. In the meantime an important circumstance had occurred which would have rendered even the total loss of the plants of comparatively little consequence.

On the 24th of December, 1834, the Tea Committee at Calcutta announced to the Governor-general in Council the important fact that the tea-plant had been discovered growing wild in Upper Assam, where it was found through an extent of country of one month's march within the territories of the East India Company, from Sudiya and Beesa to the Chinese province of You-nân, where the shrub is cultivated for the sake of its leaf. The merit of this discovery is due to Captain Jenkins and Lieutenant Charlton. Lieutenant Charlton said he had heard, in 1831, of the tea-tree growing wild in the vicinity of Beesa, and in November, 1834, he sent specimens both of the seeds and leaves of the indigenous tea-plant, and announced that it also grew wild in Sudiya. Captain Jenkins stated that on the Patkoye range of hills, which divides the waters of the Brahmapootra from those of Kuendwa, the wild shrub was in great abundance. The mountainous region which divides Cachar from Assam he thought admirably adapted to the tea-plant, and he strongly recommended that competent individuals should be sent out to collect such botanical, geological, and other details as were necessary, before taking ulterior measures with a view of bringing the tea-shrub into cultivation in that country. The mountainous tract alluded to by Captain Jenkins presents nearly a uniform geological structure, being composed of dry slate very much disintegrated. The country increases in elevation until it reaches to the eastern end of the valley of Assam, ranging from six to eight thousand feet, greatest heights. From the end of the valley of Assam this ceases to be merely a west and east range, and its direct continuation passes into the tea countries of Sechuen and You-nân in China; northward the high lands are connected with a branch of the Himalaya Mountains; and southward they divide into two branches which border the river Irawaddi on either side from its sources to the sea. The configuration of the valley of Assam is said greatly to resemble two of the best tea-districts in China. Some parts of this district are completely under British authority, and the

remainder is more or less subject to our influence. It will be found in the maps between 94° and 96° E. long., and 25° and 28° N. lat., and is watered by the Brahmapootra and its tributaries. The course of this river, after passing by Sudiya, is south-west, and the districts where the tea-trees are found are between the various tributaries on the east bank of the river. They are but little known, and Mr. Bruce, the superintendent of the tea-nurseries, is almost the only European who has explored them. The country southward of Sudiya, in latitude 28°, to the Debree river, is generally termed Chyquah; between the Debree and Burro Dehing rivers is the Muttuck country, containing 41 tea-tracts; and south of the latter river is Rajah Purundah Sing's country, in which six tea-tracts had been discovered in June, 1837. The Singpho country is east of a line drawn from the sources of the Debree river in nearly a straight line, to a small tributory of the Burro Dehing river; and at the time above-mentioned eight tea-tracts had been discovered. The Muttuck country in particular is represented by Mr. Bruce as one vast tea-tract, and the Singpho country would, he says, be "a noble tea-country," if properly cleared. We are however in some measure forestalling events, for the peculiar value of these countries as tea-nurseries was not known until some time after the Tea Committee had been in possession of Captain Jenkins's and Lieutenant Charlton's communications; and we return therefore to the period when the Committee first became informed of the fact that the tea-shrub grew in its wild state in Assam.

In May, 1835, the Tea Committee was enabled to submit a small sample of the Assam tea to the Governor-general in Council. In consequence of the rains, it arrived at Calcutta in a damp and mouldy condition. The leaves had been gathered from the wild tree, and had not been properly manipulated; but on drying them in the sun, it was considered by good judges of tea that the sample was quite equal to the inferior Congou consumed in England. Supplies of seeds and plants from China being now regarded as unnecessary, Mr. Gordon returned to Bengal, more especially as a suggestion had been made that it would be easier to introduce tea-makers from the Chinese province of You-nân than by way of Canton and Calcutta; but it was subsequently determined that, as he had engaged agents to obtain information concerning the best modes of tea culture and manufacture, who were also authorised to make contracts with Chinese capable of superintending these operations, it would be advisable for him to return to China, and he accordingly sailed from Calcutta in September.

In February, 1835, the Governor-general in Council sanctioned the appointment of Mr. C. A. Bruce as superintendent of the tea-nurseries intended to be formed in Upper Assam, Sudiya, and in other districts in the north-west of Hindustan; and authorised such an outlay as might be necessary for their formation and maintenance.

The scientific gentlemen deputed to visit the newly discovered tea-districts, consisting of Dr. Wallich, Mr. M'Clelland, and Mr. Griffith, left Calcutta in March, 1835, with the intention of reaching Sudiya by the 1st of November. They were absent about twelve months, the report which Dr. Wallich made of the results of the expedition being dated March 15th, 1836.

It appears that in Assam the tea-plant has generally been found in the forests on land subject to inundation, but above the reach of the highest floods. On the top of this land there is usually a thick wood of trees of all sizes, and amongst them the tea-tree grows and struggles for existence. The land is cut into small channels by the water in the season when floods occur, and thus forms so many small islands. On these islands, if we may so term them, the tea-plant grows along with trees of various kinds, and forms what is called the tea-jungle. The natives, in one instance, having cut down some of this jungle, set fire to the whole, and sowed rice on the spot; and on Mr. Bruce visiting it, he found the tea-plant springing up again with great vigour from the old roots and stumps. Mr. Bruce converted this into a tea-garden on account of the East India Company, and it proved one of the finest, a dozen plants springing up where there was formerly one. The plan of cutting down the shrub and setting fire to the jungle having been accidentally proved to answer so well, the experiment was tried upon another tea-tract close at hand, and proved equally successful. By way of ascertaining the result of various modes of treating the jungle-trees, they were in some instances suffered to remain, and only the brushwood and other small trees cleared to admit the rays of the sun, with more or less of shade, in order to diversify the experiment. Mr. Bruce, however, appeared to think it most advisable to treat the tea-tracts nearly as the villagers had done in ignorance of the results, and to cut the whole down, afterwards clearing the ground from weeds with the hoe. The Tea Committee determined on placing the natural tea-districts in circumstances as nearly as possible resembling those in which the cultivated plant yields the best produce; to obtain the tea-tracts by purchase or to take them on a long lease; placing them under a systematic course of management, commencing with digging and levelling the ground, and draining it in places where heavy floods occur; then protecting each nursery by a strong fence, and hiring "choukadars" to prevent theft of plants or seeds. Some of the native chieftains, acknowledging that the British government was lord paramount of the soil, and consequently was entitled to claim unoccupied lands, surrendered the tea forests unconditionally, and offered to supply labourers and a guard.

All the necessary steps having been taken to ensure success, and Chinese tea-makers engaged whose exertions were stimulated by the prospect of conditional gratuities besides their ordinary wages, the first sample of tea for the London market was received at Calcutta in March, 1838, in twelve large boxes, six of which contained "paho" of the first, second, and third qualities, and six were of "souchong" of the same degrees of quality. Each box contained 38lbs. of tea, which was packed at Calcutta in a leaden canister made by the Chinese workmen from Canton, who were at the time on their way to the tea-nurseries in Assam. They were well secured by the proper sort of matting, and fastened with slips of rattan. As the Chinese avoid shipping their finest teas on board vessels which have articles on board of strong savour, as hides and similar goods, care was taken to preserve the flavour and aroma of the Assam samples by putting each box in a soldered tin case, and placing the whole twelve by pairs in six strong wooden chests; and after these precautions, they were shipped in May. As much tea as would have filled five boxes more was sent from Assam, but in consequence of not having been packed with sufficient care, it was spoiled. This first sample consisted of the leaves of trees still in their wild state, and in October, 1838, the consignment arrived at the India House. Early in 1839, it was offered for public sale, and the novelty naturally excited an extraordinary degree of interest in the tea-market. The whole of the sample was, we understand, bought by one individual, at prices varying from 28*s.* to 34*s.* per lb., and may now be purchased at 2*s.* 6*d.* per ounce. The produce for 1839, which has already reached London, amounted to 95 chests; and the quantity likely to be produced in 1840, Mr. Bruce estimates at between 11,000 and 12,000 lbs. The scarcity of labour in Assam is found highly inconvenient in the minute processes of tea-making. Captain Jenkins says:—"We have about Sudiya an unlimited range of wastes, wastes enough for three or four millions of people, which implies, of course, that our population is very scanty, and, what is worse, they are very rude; fine,

able, strong men, but, without the introduction of a more civilized race, they are not convertible to immediate use." The economical condition of China renders that country admirably adapted for such a branch of industry as the culture and manufacture of tea; and some years must elapse before it is possible to bring into operation all the means and machinery for carrying it on successfully in Assam. One object of immediate importance is to encourage the emigration of more industrious races from other parts of India; and by opening a free communication with Ava, and forming good roads, colonies of Shans and Chinese may be induced to settle in the newly discovered tea-districts. Those who are acquainted with the people of these parts of the East conceive that if such an intercourse were established, the detachment of the province of You-nân from the Chinese empire would possibly follow. In 1838, two Chinese black-tea makers were employed, and last year two Chinese green-tea manufacturers were added to Mr. Bruce's establishments. Each Chinaman has half a dozen natives under him as assistants, but in consequence of the small number of tea-makers, the leaves are brought from a distance for manufacture, and the gathering occupies so long a time that the leaves become old and large before this operation is finished. Each garden should have its own tea-makers and gatherers; but in the infancy of the experiment this cannot be effected. The present state of our trade with China will be likely to stimulate the East India Company, at whose expense this enterprising project has hitherto been conducted.

Mr. Walker, a gentleman who has paid much attention to the subject, says that a man can gather about 15 lbs. of leaves per day; and it appears that the price of labour in India is from 2*d.* to 3*d.* per day, while in China it is much higher, being for women 5*d.*, and for men 7*d.* The problem is to direct this cheap labour into a new channel. The Assam tea is undoubtedly a wholesome beverage, and if it can be produced cheaper than the teas of China, the profits of the experiment cannot fail to be very high; and this being the case, it will no doubt be worked out. Under any circumstances, an article may be produced which will come largely into demand in Thibet, Tartary, and other parts of Asia. Tea is regarded as a great luxury by the natives of India, but the high price of Chinese teas does not permit them the enjoyment of this grateful beverage. Captain Jenkins, an agent of the Indian government on the north-western frontier, is of opinion that "a very moderate outlay will suffice to give our poor but immense population in India the means of adding to the very few luxuries they now enjoy, one of the most innocent, pleasant, and salutary known, and thus create an internal trade, the extent of which it is impossible to foresee." Even if England should not derive its supply of tea from Assam, immense advantages would be derived from the partial success of the Assam experiments. In two or three more seasons we shall be able to ascertain more clearly the capabilities of Assam for the production and manufacture of tea.

There is yet another advantage which may be derived if we are enabled to compete with the Chinese in the cultivation of the tea-tree. We can either obtain more advantageous commercial conditions on which our intercourse with them may be continued; or, if these are not conceded, we have the alternative of raising our supply of tea from Assam. We had at one period access to several parts of China, but have long been confined to Canton, at the western extremity of the empire, and at the greatest distance from Pekin, the capital. Canton is perhaps the most unsuitable port in China for a commercial emporium. It is separated by a range of mountains from the richest parts of the country and from the tea-districts; and our imports are consequently diminished to the smallest possible quantity. Metals will not of course bear an expensive inland transport; and woollen goods, which the climate of Pekin and the northern parts of China would render extremely useful, must be conveyed a distance of twelve hundred miles inland, and across the mountains they must be carried for some distance on men's backs. The articles of Chinese growth which are purchased by Europeans at Canton have to bear not only the heavy expenses of internal transit, which would be avoided if we had access to more convenient ports, but their price is also enhanced immoderately by dues levied on shipping and by the exaction of many indirect charges.

Influence of the Beautiful.—Every true specimen of perfection, or even excellence, of whatever kind it may be, from the moral down to the physical, elevates every instance of an inferior degree of excellence that we meet with, and sheds over it a portion of its own perfection.—*Francis Lieber.*

Simple Elements of Men's Agency.—Labour produces its desired effects only by conspiring with the laws of nature. There is no commodity, or thing produced for consumption, which labour provides in any other way than by co-operating with the laws of nature. It is found that the agency of man can be traced to very simple elements. He can do nothing more than produce motion. He can move things towards one another, and he can separate them from one another: the properties of matter perform all the rest. He moves ignited iron to a portion of gunpowder, and an explosion takes place. He moves the seed to the ground, and vegetation commences. He separates the plant from the ground, and vegetation ceases. Why, or how, these effects take place, he is ignorant. He has only ascertained by experience, that if he perform such and such motions, such and such events will follow. In strictness of speech, it is matter itself which produces the effects. All that men can do is to place the objects of nature in a certain position. —*Mill's Political Economy.*

Variety of Dispositions and Occupations.—It is the great wisdom and providence of the Almighty so to order the dispositions and inclinations of men, that they affect divers and different works and pleasures; some are for manuary trades, others for intellectual employments; one is for the land, another for the sea; one for husbandry, another for merchandise; one is for architecture, another for vestiary services;* one is for fishing, another for pasturage; and in the learned trades, one is for the mistress of the sciences, divinity; another for the law, whether civil or municipal; a third is for the search of the secrets of nature, and the skill and practice of physic; and each one of these divides itself into many differing varieties. Neither is it otherwise in matter of pleasures: one places his delight in following his hawk and hound, another in the harmony of music; one makes his garden his paradise, and enjoys the flourishing of his fair tulips, another finds contentment in a choice library; one loves his bowl or his bow, another pleases himself in the patient pastime of his angle. For surely, if all men affected one and the same trade of life, or pleasure of recreation, it were not possible that they could live one by another; neither could there be any use of commerce, whereby man's life is maintained; neither could it be avoided but that the envy of the inevitable rivality would cut each other's throats. It is good reason we should make a right use of this gracious and provident dispensation of the Almighty; and therefore that we should improve our several dispositions and faculties to the advancing of the common stock; and withal, that we should neither encroach upon each other's profession, nor be apt to censure each other's recreation.—*Bishop Hall.*

* Such occupations as that of a clothier.—Ed.

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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ROMSEY.

[The Abbey Church, Romsey, Hampshire.]

THE antient town of Romsey, *Romseige*, or *Romesege*, has more claims to attention and is better calculated to reward that attention than many other places of double the population. It is still of considerable magnitude as a country-town in an agricultural district, the population of the two parishes, Extra and Infra, being 5432, according to the census of 1831, which is an increase of 26 per cent. within the twenty years preceding. This is a little remarkable, because, during that time the last remains of its lingering woollen manufacture have gone, and the manufacture of paper, which once was considerable, is very greatly reduced. The only manufactures that it can now be said to have are those of parchment and other dressed skins; and the chief trade, besides the vending of these, is wool-stapling. The town is, however, situated in the middle of a rich agricultural district, upon the left bank of the little river Test, about ten miles from Winchester, fourteen from Salisbury, and eight from Southampton; and a great deal of business is done in the purchase of corn and the preparation of flour and malt.

Romsey Abbey was founded very early in the tenth century, and appears to have been richly endowed. It was a nunnery, and several members of the Saxon royal family were abbesses. The original buildings were totally destroyed by the Danes, and subsequently rebuilt. It is impossible to say what may have been the style of architecture in the Abbey, properly so called, because no part of it remains; the church, however, is Norman, as is evinced by its majestic height, and the bold mouldings and sculptures on the capitals. But while the buildings of the Abbey, the cloisters, and all that gave the place a monastic air, have been swept away, the church has been carefully preserved, and is one of the most spacious and elegant in the county.

The situation on which the church stands is commanding, and though its elevation above the irrigated meadows is not great, it is dry. Along the north there is the churchyard, and if beauty could be predicated of the last mansion of the dead, one would call it beautiful. On the west there is a pleasant little spot, tastefully laid out in grass and shrubs and flowers, and not used as a burying-ground. The eastern precinct, within the gates, consists of a paved court; and on the south, where the apartments of the abbess and her nuns, with due accommodation for father confessors, were situated, is occupied by buildings, among others by the hall in which the sessions for this division of the county are held, and which is given up to the Literary and Scientific Institution upon lecture-nights. Some foundations and other remains of the Abbey existed here till lately; but we believe they are now all cleared away.

The church is, as is usual in complete structures of this kind, in the form of a cross, consisting of a nave and chancel as the stem, and two transepts as the arms, with a massive tower supported upon pillars, and circular arches over the intersection. The length of the nave and chancel is about 240 feet, and the breadth along the transepts more than 120. The whole is very lofty, even in proportion to the extent of the horizontal dimensions. The chancel and

transepts, with the eastern part of the nave, are in the richest style of purely Norman architecture; and the tower is also Norman; but the western part is of a mixed style, inclining to what is usually termed Gothic, with pointed windows divided by mullions, and the great west window consists of three lancet-headed compartments, the central one more lofty than the others, so that they harmonise with a large pointed arch of blind masonry in which they are included. The internal ornaments on the arches of the most ancient part are, generally speaking, zigzags in very bold relief; and the architecture of the whole of this portion is in very fine taste. Though more modern, the western part is inferior, but still it is handsome. The nave has side aisles parted off by pillars; and round the chancel there is an external passage of some width, inferior in height to the interior, but with singularly fantastic sculptures on the capitals of some of the pillars. In this place some of the best monuments are situated, which is in much better taste than if they were in the place devoted to public worship—though there are some there also. The modern communion table is placed upon the high altar, within the doubly enclosed part of the chancel; and here there is a neat modern window of stained glass. The pulpit is considerably in advance of this, so that the voice of the preacher may be alike audible in the transepts and the portion of the nave which is included in the church. The pewage of the whole is modern and very neat. No part of the roof is arched; but the chancel over the communion table has a compartmented ceiling tastefully painted, although the painting is modern, and was executed by an inhabitant of the town. The flooring under the tower, which cuts it off from being a lantern, for which purpose it was perhaps never intended, is also in compartments, and the painting upon it is ancient and faded. The transepts and nave have no ceiling; but the oaken roofs, which do not appear to have been repaired since the first erection, and which stand in no need of repair even now, although plain, are handsome, well contrived, and very substantial. In speaking of the roofs, we may mention that there are upon the sides of the tower cheveron marks, each higher than the other, which indicate the existence of two former roofs, both of which were probably of stone, before the introduction of lead, as even the lowest of the two has a much higher pitch than the present leaden one.

The eastward angles, between the transepts and the chancel, are filled up by two buildings enclosed by arcs of circles, which may at one time have been the chapels or chantries of local saints whose names have now perished with the record; but one of them is now used as a vestry, and the other is a sort of grammar-school, while a Sunday-school is held in a divided portion on the west end of the south aisle of the nave. The tower, which surmounts the intersection of the body and transepts of the church, is accessible by a circular staircase enclosed in the wall at the south-western angle, and consists of 151 stone steps. Near the top of the tower, or rather in a wooden belfry over it, there is a peal of eight bells of the finest tone; and the lead roof surrounding this belfry, and enclosed by a very low parapet, commands a delightful view of the surrounding country. Some years ago there was rather a singular curiosity upon this roof;—it was an apple-tree which grew upon a small portion of mould there, and blossomed and ripened its fruit every year, in the same perfection as if it had been in an orchard. It does not, however, exist at the present time, but whether it was removed by natural decay or by ejectment we are not informed.

There are many architectural peculiarities in the inside of Romsey church which are well worthy of being known; but they are not subjects for the pen, or even for the pencil, except for the most skilful artist. If the interior could be seen from a favourable point of view, the representation of it, looking toward the chancel, would be a treat in ancient architecture; but the division of the length by the screen below the gallery—though a very fine one—and the curtain above the gallery, which is to the full as ugly, defeat the artist in this, and there is no resourse but in geometrical measurements and a perspective projection, which the usual rewards of modern art could not afford. An actual visitor may manage it, because he can shift his eye from point to point, while his memory retains a perfect knowledge of the portion last seen; but as the perspective draughtsman can have no more than one point of sight, a good view of the interior of Romsey church is one of the impossibilities, and therefore, to be fully appreciated, it must be actually visited.

We have left but little space to notice the sculptures and monuments. The former are few, with the exception of the grotesque figures on the capitals of some of the pillars and along the mouldings under the eaves of the nave, together with a very fine representation of the Crucifixion upon the western wall of the south transept, which had once been under the cloisters, in the passage of the nuns from their apartments to a highly ornamented doorway near the angle where this transept joins the south aisle of the nave. Among the monuments the most notable is that of the highly gifted and remarkably successful Sir William Petty, ancestor of the Marquis of Lansdowne, and one knows not whether most to admire the character of the man or the simplicity of the monument. It is a rude stone in the pavement without the chancel, and near the door of the vestry; and the only inscription on it is, "Here leyes Sir William Petty."

EXHIBITIONS OF MECHANICS' INSTITUTES.

Several of the leading Mechanics' Institutes in the country have recently adopted the plan of preparing temporary exhibitions of objects of science and art, pictures, antiquities, natural curiosities, &c., which have been so well managed as to have attracted a large number of visitors. The funds of the institutions have not only been benefited, but a stronger interest has been aroused as to the objects which they are designed to promote. We have received two Reports of Committees appointed to manage the Exhibitions of the Mechanics' Institutes at Sheffield and Leeds; and as a great number of such institutions in other parts of the country might prepare exhibitions of a similar character, we give a short account of the arrangements which were made at the above two places.

At Sheffield, the town and neighbourhood were canvassed by the managers of the proposed exhibition, and it is creditable both to the members of the Mechanics' Institute and to the inhabitants that 436 contributors were found, from whom the loan of 2654 objects and specimens of various kinds were obtained; and the Council of the Literary and Philosophical Society granted the use of their Museum, which was kept open from the commencement to the close of the exhibition. The loans from individuals comprised 1460 specimens of manufactures, models, &c.; 387 oil-paintings, 45 water-colour drawings, 43 pencil drawings, 153 engravings, 46 medallions in wax and plaster, 76 busts and plaster figures, 4 specimens of needlework, 280 specimens of natural history, 140 groups of geological specimens, and 20 cases of entomological specimens. The Music-hall was engaged at a rent of twenty guineas per month. The Report says:—"37,773 persons purchased single admission tickets at 6*d.* each; 1868 bought season-tickets at 2*s.* 6*d.* each; 5907 scholars belonging to Sunday and other free schools were admitted, chiefly at 1*d.* each. The poor inmates of the Sheffield and Brightside Bierlow workhouses, and the boys and girls belonging to the

charity schools, were all admitted gratis. The receipts at the doors, together with profits on confectionary sold, amounted to 1318*l.* 10*s.* 4*d.* The total expenses were 651*l.* 10*s.* 10½*d.*, leaving a balance of 666*l.* 19*s.* 5½*d.* in favour of the institution. The individuals who saw the exhibition, including the repeated visits of those who took season tickets, would scarcely be less than 70,000.

The moral results of such an exhibition are of a valuable kind, and such as to encourage other institutions, and those who may be disposed to assist them, in following the example of Sheffield. The Committee observe:—"First, there is no doubt that the owners of rare and valuable articles possess means of forwarding the moral and mental education of the people; and the contributors to the late exhibition have, by their liberal conduct, done perhaps as much to benefit the working classes of Sheffield as they could possibly have done in any other way. Secondly, your Committee feel convinced that in the present condition of society, scientific and literary instruction will be most effectually given to the people in connection with rational and recreative enjoyments."

At Leeds, we learn from a printed circular addressed to individuals who had lent specimens, that the exhibition had also been highly successful. It was open during three months, and the Committee state that "within that period, 87,908 persons have been admitted at 6*d.* each, and 6220 persons have purchased season-tickets, whose aggregate visits have amounted to 96,005; making a total of admissions of 183,913. Allowing for the repeated visits of persons who have paid the sixpenny admission, not less than 93,500 individuals have enjoyed the high gratification of attending the exhibition. The receipts, inclusive of about 425*l.* proceeding from the sale of catalogues, and of several poetical effusions written for the occasion, and the profits on confectionary, amount to the sum of above 3400*l.*; and, after deducting the ascertained and probable expenses of the exhibition, it is supposed that more than 2000*l.* will remain to be appropriated to the object contemplated by its promoters."

Here also the moral effects were very encouraging. The greatest order and decorum were at all times observed; and the Committee state that they cannot but conclude that "the large resort of visitors indicates a growing taste for the contemplation of the works of art and nature, and the study of science; and they feel assured that *that* taste has been materially strengthened by the concentration, in a small space, of so many splendid and beautiful, and, in some instances, rare specimens of each."

TEA-MAKING IN CHINA AND ASSAM.

We apply the term 'tea-making,' in this instance, to the preparation which the leaf of the tea-plant undergoes before it is fit to be made use of as an infusion. Green and black teas, to one or other of which class all the varieties of tea in consumption belong, are not, as generally imagined, the produce of two distinct varieties of the tea-tree, but the distinction is occasioned solely by the different mode in which the leaves are manipulated by the tea-maker. Not only, therefore, may black or green tea be prepared from the same plant, but all the different varieties of each sort.

In the tea-plantations in China the trees are planted in a straight line, three or four feet apart, on small ridges eight inches or a foot in height. When they are three or four years old,—for soil and situation cause some difference as to time,—the leaves may be plucked at the proper season without injury to the plant. If the weather is warm and fine, and the season has not been very cold, the first crop of leaves is plucked in May; the second crop about six or seven weeks afterwards; and a third plucking commences about six weeks after the second is finished. The season therefore lasts from May until after the middle of July. Some plants produce 1¼lb. of leaves in the season; but the average is usually a quarter of a pound for the first crop; the second crop yields rather a smaller quantity; and a third crop is not invariably taken, for fear of injuring the trees.

The quality of teas, whether black or green, depends upon the period of the season when the leaves are plucked. The finest tea is made from the tender and fleshy buds pinched off above the stem. The coarser teas are made from leaves gathered when they are fully grown, the persons employed nipping off, with the fore-finger and the thumb, the fine end of the branch, with about four leaves on it, and sometimes more if they look tender. The circumstances which primarily determine the price of different kinds of tea is therefore evident; but this may be made clearer and the subject of tea-making more completely illustrated by a brief notice of the principal varieties of each class of teas; and we will begin with the Black Teas, as five-sixths of the teas consumed in this country are of this class.

1. Pekoe, a corruption of the Chinese name of Pak-ho ("white down"), consists of the newly developed buds before they have had much time to expand. Black-leaved Pekoe is made from leaves which have been allowed to grow a few days longer. 2. Souchong (in Chinese Seaou-choong, "small or scarce sort") is from the fully-developed leaf when in its tenderest state, and forms the finest sort of the stronger black teas. 3. Congou, the next in quality to Souchong, is called by the Chinese Koong-foo ("labour—assiduity"), and consists of a careful selection of the full-grown leaf before it has become old and coarse. Campoi, a corruption of Kien-poey ("selection—choice") is a superior variety of Congou. 4. The least esteemed tea comes from a district called Bohea, and with us the name is applied to black tea of the lowest quality. Thus, Canton Bohea is a mixture of the commonest Congou with the inferior tea of the province. The leaves are gathered when they have attained their full growth and have become old and coarse, and on this account the Chinese call Bohea Ta-cha ("large tea"). Partly on account of being subjected more to the fire, the infusion is of a darker colour than any other sort of tea; and the manner in which the leaves are gathered will account for the woody fibres it contains.

Green teas of every variety are of a more delicate flavour than the corresponding qualities of black tea. They are less fired, and consequently will not keep quite so well. The following are the principal kinds in use in this country:—1. Young Hyson is made from the earliest gathered leaves of the season, and by the Chinese is called Ya-tsien ("before the rains"). Hyson Pekoe is a superior variety, which is so slightly fired and delicate as not to bear the voyage to Europe. 2. Hyson, from a Chinese name signifying "flourishing spring," is gathered when the leaves are in the course of development, and it is prepared with the greatest care, every leaf being separately twisted and rolled by hand. "Gunpowder" is a selection of the roundest and best rolled Hyson, and is called by the Chinese Choo-cha ("pearl tea"). 3. Hyson-skin is a selection of the coarser leaves of Hyson, as Gunpowder is of the finer; but, though consisting of leaves which are the least twisted or which are in any way of a less fine appearance, Hyson-skin is necessarily a superior description of tea, as the bulk from which it is taken is of the best quality. 4. Twankay is made from older leaves and with less care than any of the preceding, and is therefore the cheapest kind of green tea: of the green teas consumed in England three-fourths are Twankay.

Comparing green teas with black, Twankay and Bohea may be placed in a corresponding scale; Congou corresponds with Hyson-skin, Souchong with Hyson, and Young Hyson with Pekoe.

In the following details the mode described of making Black Tea is that practised at Sudiya, in Upper Assam,

by the Chinese employed under Mr. Bruce, the superintendant of tea culture.

The leaves, being brought to the place where they are to be converted into tea, are thinly scattered in large circular open-worked bamboo baskets, and placed in the frame-work of bamboo represented in *Fig.* 1. Here they are left exposed to the sun for about two hours, or until

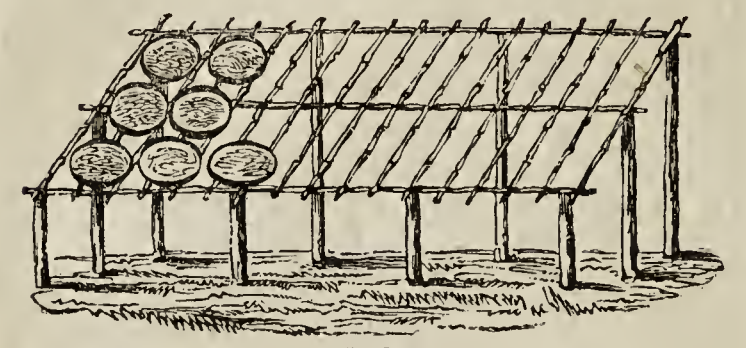

Fig. 1.

they have a slightly withered appearance, the leaves in the meantime being occasionally turned by the hand. The baskets are then taken into a covered building and placed on a frame similar to the above, except that the upper part is not sloping; and after cooling half an hour, the leaves are put into smaller baskets of a similar kind, and placed on a stand. The tea-makers now take the leaves up between their hands, with the fingers and thumb extended, gently tossing them up and down for the space of five or ten minutes. The baskets are again put on the frame for half an hour, when they are again manipulated as before. When this has been done three successive times, the leaves feel something like soft leather.

The next process is "firing." The leaves are put into cast-iron pans fixed in a circular mud fire-place (*Fig.* 2),

Fig. 2.

and the pan being well heated by a straw or bamboo fire, about two pounds of leaves are spread equally in each pan. While on the fire, the leaves are frequently turned with the naked hand, to prevent their burning, and as soon as they become inconveniently hot they are received by another man into a closer-worked bamboo basket, and taken to a table having a narrow rim round it. The two pounds of hot leaves are divided amongst two or three men, and each forms a ball of the portion of leaves allotted to him, which is grasped gently in the hand, with the thumb and finger extended, as in *Fig.* 3. Some force is used to express any juice

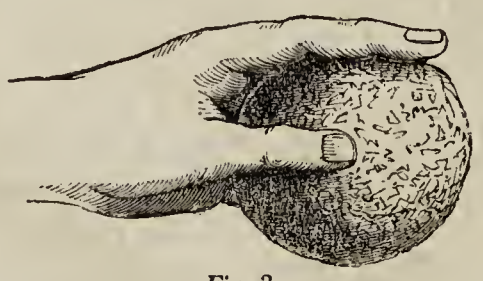

Fig. 3.

which may remain in the leaves. Mr. Bruce says that in this part of the process "the art lies in giving the ball a circular motion and permitting it to turn under and in the hand two or three whole revolutions before the arms are extended to their full length, and drawing the ball of leaves quickly back without leaving a leaf behind." The ball is rolled in this way for about five minutes, during which it is two or three times opened gently with the fingers, lifted as high as the face, and then allowed gently to fall again, to separate the leaves.

The fire is again resorted to; and as soon as the leaves are taken back to the hot pans they are spread out in them as before; also turned with the hand; and when hot taken out and brought again to the table, where the rolling process just described is repeated. The leaves are next put into the drying basket, and spread three or four inches deep in a sieve, in the centre of the basket, and then placed over a glowing charcoal fire free from smoke, a passage being left in the centre of the sieve for the hot air to ascend. As soon as they appear half dried, and while still rather soft, the leaves are taken off the fire, and placed in large open-worked baskets, which are put on the frame, where they remain for some time in order that their colour may be improved.

On the following day the leaves are sorted into large, middling, and small, which form so many different varieties of tea; and each sort is again put in the drying basket, but this time the sieve is only slightly covered with leaves. As quickly as the leaves become crisp with the action of the fire, they are thrown into a large receiving basket. Again, however, they are subjected to the fire, but now they are placed eight or ten inches deep in the sieve, a small passage being left for the hot air as before, and another basket is thrown over the whole to throw back

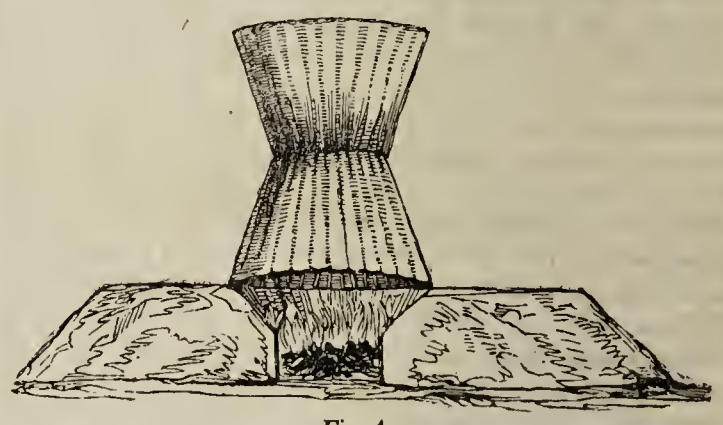

Fig. 4.

the heat. (*Fig.* 4.) The fire, which was before bright and clear, is deadened; the basket is occasionally taken off and placed on the frame (*Fig.* 5), the leaves gently turned over, and the basket replaced on the fire. Mr. Bruce says that the process is thoroughly completed when the

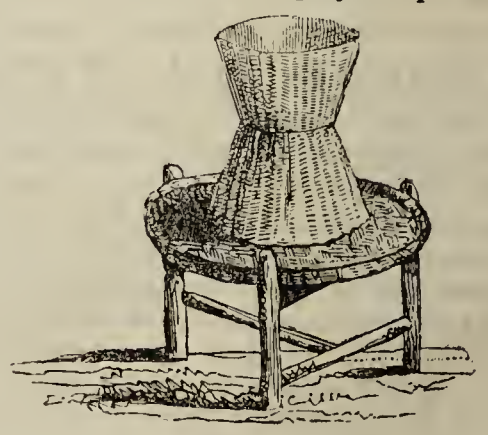

Fig. 5.

leaves have become so crisp as to break under the slightest pressure of the fingers. The tea is now put into boxes, being first pressed down with the hands and then by the feet, the men engaged having first put on clean stockings.

We do not yet possess minute details of the process of making green tea, which is manufactured in China by a class distinct from the black-tea makers; but it is probable that we shall not be long without information from Assam on this point equally minute as the account from which we have obtained the above details.

In the districts in Assam where the tea-plant grows wild, a very rude mode of preparing the leaves is practised. In the Singpho country the natives pluck the young and tender leaves and dry them a little in the sun, or put them out into the dew and then expose them to the sun for three successive days; or again, others, after a little drying, put the leaves into a heated pan, turning them about until they have become quite hot. They are then put into the hollow of a bamboo, the whole being driven down with a stick, the bamboo being held over the fire until it is full. Some leaves are then tied over the end and the bamboo is hung up in some smoky corner of the hut; and it is said that the tea thus prepared will preserve its properties for many years. Eastward of the Singpho country, a still more singular method of tea-making is adopted. Holes are dug in the earth, and the sides being lined with large leaves of some kind, the tea leaves, after being partially boiled, are put into the hole, which is then covered with earth, and the mass in the interior is allowed to ferment. It is afterwards taken out and filled into bamboos, and in this manner is an article of commerce in Thibet, resembling probably the "tea-cakes" described in No. 484 of the 'Penny Magazine.'

THE HISTORY OF A COAT-BUTTON.

When we say, with reference to an apparently worthless object, that it is "not worth a button," we do not quite know what we are talking about. A button, considered with respect to the manufacturing wealth of the country, is anything but an insignificant article; for the production of the various kinds which are worn by us gives employment to many thousand persons, men, women, and children, in the north of England; and at a time when the legislature was more prone than at present to interfere with the natural progress of trade and manufactures, numerous statutes were made, having for their object the protection and advancement of the button-trade. Strenuous efforts were even made to stem the course of fashion, and to keep the public taste in a path favourable to the early button-makers; but such efforts generally fail in their object.

The ancients do not appear to have used buttons, except a few on the shoulders and arms of women's tunics; or two, connecting the two square pieces of the tunic, near the neck. Among the people and the soldiery, brass buttons frequently fastened a kind of cloak on the right shoulder. They appear to have been used in England, probably more for ornament than use, in the tenth century: gold or silver was generally the material of which they were made, and they were of foreign manufacture.

As to the materials of which buttons have been made in more recent times, they are almost innumerable; but among them are gold, silver, plated copper, white metal, pinchbeck, steel, japanned tin, glass, foil-stones, mother-of-pearl, ivory, bone, horn, tortoiseshell, jet, cannel coal, paper, leather, &c., exclusive of those buttons which consist of a mould of wood or bone, covered with mohair, cloth, thread, or some similar substance. We will take a rapid glance at the modes of manufacturing some of these kinds of buttons.

Those which are called *covered* buttons have generally a central piece of flat horn or bone called a *mould*. These moulds are small circles, perforated in the centre, and made from those refuse chips of bone which are too small for other purposes. For large or coarse buttons, these moulds are generally made of wood; but whether bone or wood, they are formed as follows:—the material is sawn into thin and equal flakes, from which the moulds are cut out by an operation which, at the same time, makes a perforation through the centre. A lathe is provided with a cutting tool having three projecting points. A girl places a flake of bone or wood in a position where the tool can act upon it, and, by the rotation of the tool, the two outer points cut out the circular mould, while the central point perforates through it. While this is doing, the surface of the mould is worked smooth by the parts of the tool intermediate between the points. When a mould is thus made, it is dropped into a box beneath, and the girl exposes a new part of the slip of horn to the action of the instrument. A girl, ten or twelve years of age, is enabled to cut out twenty or thirty button-moulds per minute in this manner. The fragments, sawdust, &c., are all sold for manure, &c., so that not a particle of bone is lost. If wood be employed, it is generally oak, beech, or elder, dyed black with nut-galls or some similar dye.

These button-moulds were formerly covered with threads of gold, silver, silk, and other costly materials. Several women sat round a table, each having a large needle fixed in the table opposite the part where she was seated, and also a bobbin or reel, containing the thread which she was to use. The mould was held by the hole in its centre upon the needle, and the end of the golden or other thread was at the same time put through the hole and fixed. The thread was then wound over and round every part of the mould in a peculiar way, so as everywhere to present a surface of thread, and also a determinate pattern, according to the fashion of the day. When this was effected, the end of the thread was secured; and, at the back of the button, a number of the folds of thread were taken up and tied together, so as to form a kind of shank for fixing the button to the garment.

Such was the kind of button worn in England for a long period, and their manufacture employed a very large number of persons, chiefly aged females and children, who covered the moulds with threads of various kinds. When the fashion arose of covering the moulds with the same cloth as the garment was made of, a great outcry arose, and a petition was presented to parliament, of which the following is a part:—"It appears by long experience that needle-wrought buttons have been a manufacture of considerable importance to the welfare of this kingdom, insomuch that whenever such buttons have been disused, the wisdom of the nation hath always interposed, as may be seen by the several acts passed in the reigns of King William, Queen Anne, and of his Majesty in this present parliament. Yet, notwithstanding the said acts, the tailors continue to make buttons and button-holes of the same materials the cloths are made of; and the said acts cannot be put in execution, because of the great difficulties that attend the detecting and prosecuting the offenders." The petitioners then pray for some additional protection, but with little success, for tyrant fashion little respects acts of parliament on these subjects. Very little has been known of these needle-wrought buttons within the last half century, for more speedily-executed plans were sought for.

For common wear, *horn buttons*, without any covering, have been much employed. These are made both with and without shanks, those without shanks having four holes, by which they may be attached to the garments. These last-named horn buttons are made concave in front, to preserve the thread by which they are sewed: they are made as follows:—cow-hoofs are boiled in water till they become soft, and are then cut into parallel slips by a cutting-knife or blade, which acts as a lever by having a hinge at one end. These slips, which are of the width of the diameter of the button, are then cross-cut into small squares, and the angles cut off. The pieces are dyed black by being immersed in a cauldron containing a solution of logwood and copperas, and then dried. A mould is formed, something like a pair of pincers, each half having six or eight small steel dies fastened to it, each die containing the impression of the intended button embossed upon it. When shut close, the opposite dies

exactly correspond, and represent the entire shape of the button. The mould being heated somewhat above the temperature of boiling water, a piece of horn is placed upon each impression in it, and the mould is then closed and confined within a powerful press or vice. The united action of the heat and of the pressure forces the pieces of horn to take the exact impression of the two halves of the dies, and they come out in the form of buttons, plain or embossed, as the case may be, but with their outer edge a little ragged: this roughness is removed by filing, the button being held in a lathe.

If the horn button thus made is to have no shank, four or five holes are drilled through it by an ingeniously-constructed lathe; but if shanks are required, these must be firmly united to the horn. The shanks are made in a curious manner. Brass or iron wire is wrapped spirally round a steel bar by the rotation of the bar in a lathe. The coil is then slipped off the bar, forced into a somewhat oval form, and cut through its whole length, so that each turn of the coil produces a button-shank of an oval form, with two disengaged ends. More recently an elegant little machine has been invented, which, by the simple turning of a winch, supplies itself with wire from a reel, and delivers it, cut and bent, to the proper figure of the shank: each turn of the winch forms a shank. Shanks such as these are inserted in the horn buttons by children, who, previous to the pressing in the mould, drill a hole in each button-piece, and insert the shank. The mould has a cavity for receiving the shank, and the pressure closes the horn about it so effectually, that it will not come out. Sometimes horn buttons are made plain, and then have a pleasing device made upon them by placing on their surface a thin plate with a pattern cut in it: by rubbing over the plate with emery-powder, the horn will become scratched or deadened through the holes in the plate, but left polished at the other parts.

Metal Buttons are used to an enormous extent, though at present, perhaps, not so much as they were twenty years ago. They are made in two ways, either by *casting* or by *stamping*, the latter of which is the most general. The casting of buttons is thus effected: a considerable number, from fifty to a hundred and fifty, of buttons of any desired pattern are ranged near each other, and connected by little bits of metal. An impression from this collected pattern is made in sand, by pressing the button evenly on a very smooth sandy surface; by this means every button makes a mould, exactly the same size, form, and pattern as itself. A shank is then pressed into the sand in the centre of each impression, the part which is to enter the metal being left projecting above the surface of the sand. The buttons are now cast, from whatever metal may be chosen for that purpose; brass, pewter, tin, and zinc, used either singly, or combined two or three together, are the usual materials for such buttons, the zinc being used chiefly to enable the other metals to flow more readily into the moulds. When the buttons cast from the melted metal are cold, they are cleaned from the sand by brushing; they are then broken asunder, and each button carried to a second workman at the lathe, who, after having retained it firmly by means of the shank, carefully files the circumference, by which he reduces it to a true circle. By removing the button to another lathe, the back and face are smoothed and rendered even by tools fitted for the purpose. The buttons are then polished, by fixing the shanks in a piece of board, and rubbing the faces on another board covered with leather and strewed with rotten-stone and oil. The last polish is given by applying the button lightly to the edge of a wheel covered with soft leather, and dressed with very fine powder of rotten-stone. Sometimes buttons of this kind are rendered white, somewhat resembling silver. To produce this effect, melted tin is poured into cold water, and by this means granulated. A quantity of cream of tartar, diluted with water, is put into a boiler, and the tin added to it; the boiling causes part of the tin to be dissolved; and the buttons being let down into the liquor upon a wire grating, part of the tin attaches itself to the metal buttons, rendering them white, and preserving their former polish. This method of washing with tin produces a white colour which remains for a considerable period.

But the *gilt button* is the most interesting result of this manufacture. Here there is no casting. The button is stamped out from copper, slightly alloyed with zinc, and laminated in a flatting-mill to the proper thickness. The stamp is moved by a fly-press, which cuts out circular pieces, called *blanks*, at one stroke. These blanks are annealed in a furnace, to soften them, and the maker's name, &c., is struck on the back by another stamp.

Into the blanks thus made, the shanks are fixed. A shank is placed upon each blank, and held down upon it by a sort of spring tweezers. A small quantity of spelter and borax is placed round each shank, and ten or twelve dozen in this state are introduced, upon a large iron shovel, or peel, into an oven, heated sufficiently to fuse the solder. When this is effected, the shanks are found to be firmly united to the blanks. The edge of each button is then turned smooth in a lathe, and a number of buttons are dipped into a *pickle* of dilute nitric acid, to cleanse their surfaces. Each button is then burnished with a hard black stone, called blood-stone, fixed into a handle, and applied to the button as it revolves by the motion of a lathe; the stone employed is a peculiar kind of iron-ore, found at many places in Derbyshire.

The buttons are now in the state to be covered with a thin film of gold. The gold, mixed with mercury, is placed in an iron ladle, and heated until they are perfectly united. This amalgam of gold is put in an earthen pan, and a quantity of dilute nitric acid being poured in, the buttons are introduced, and stirred about in the mixture by means of a brush. The chemical nature of what ensues is curious; for the acid acts as an agent for spreading the amalgam over the surface of the copper button, and the mercury of the amalgam acts as the agent by which the gold, the other ingredient of the amalgam, is permanently fixed on the copper; neither the acid nor the mercury are of use except as agents, as means to an end. Consequently, when the process which we have just described, and which is called *quicking*, is completed, the nitric acid is washed off by means of clean water; and subsequently the mercury is also driven off, but by the aid of heat instead of water. The processes connected with the driving off of the mercury, as well as some details respecting the extraordinary thinness of the film of gold left upon the button, will be found in a paper on the "Divisibility of Gold in Manufactures" ('Penny Magazine,' vol. i., p. 402). We will therefore here only observe, that after the mercury is removed, the button is brilliantly polished.

Plated buttons are made from plates of copper, to one side of which a thin sheet of silver has been attached by the powerful pressure of the flatting-mill. The blanks are cut out of this sheet by a stamp, as in the gilt button, and the shank is fixed to it with silver solder, and with the aid of a blow-pipe, for the heat of an oven applied to the whole button would endanger the silver. The washing in nitric acid, the burnishing, &c., are applied as in the last instance, but neither mercury nor gold is employed.

Cup buttons, either plated or gilt, are made of two pieces, viz. a common flat button with a shank, and a small hemisphere fixed on in front. These hemispheres are punched out by the fly-press, and then the inside is turned in a lathe, to receive the edge of the plain button, made as before described. When put in its place, the edge of the cup is burnished down over it to hold it fast. These buttons are afterwards gilt and burnished in the same manner as plain ones.

It must be evident, that most of the materials for buttons which we have enumerated, may be manufactured in one or other of the few modes we have pointed out; and we need not therefore extend this paper to dwell on them. We will state one or two circumstances illustrative of the extent of the button-trade. Previous to the year 1815, upwards of one thousand persons were employed in Birmingham in the making of fancy white metal buttons, cut by an engine; it was a cheap showy article, and almost the entire produce of the numerous hands employed was sent to the Continent. A single artisan, well acquainted with the processes of the manufacture, happening to be detained by Bonaparte, stated to the French government his ability to establish a workshop and produce the button. He was immediately patronised; the trade presently left Birmingham, and France supplied the markets of Europe. Another kind, called the "Bath metal drilled shank button," of which 20,000 gross were made at Birmingham per week, at one period, was lost in a similar manner. In speaking of buttons, Mr. Hutton says: "In some branches of traffic, the wearer calls loudly for new fashions; but in this, the fashions tread upon each other, and crowd upon the wearer. The consumption of this article is astonishing, and the value, in 1781, was from three pence to 140 guineas per gross." In 1818, the art of gilding buttons had arrived at such a degree of refinement in Birmingham, that three pennyworth of gold was made to cover a gross of buttons; these were sold at a price proportionally low. The experiment has been tried to produce *gilt* buttons *without any gold;* but it was found not to answer, the manufacturer losing more through the decreased demand than he saved in the material.

ON CORAL AND THE CORAL FISHERY.

Coral is one of those many substances which for a long period baffled the attempts of naturalists to account for their origin. Growing as it does beneath the surface of the water, and presenting some indications of an organised structure, many early observers considered it to be either an animal or a plant; while on the other hand, the hard stony texture which coral presents induced many to class it among mineral productions. It presents the appearance of a kind of shrub growing beneath the water, and has, at the surface of its branches, certain organised structures, which were at one time considered to be flowers, but which are now known to be animals. There are a great number of organised structures which bear this character; but we shall here confine ourselves to one single species of them all, viz. that one known as *red coral.*

Red coral was known in early antiquity; and the Greeks, in calling it *korallion* (from two Greek words signifying to *ornament* and *sea*), merely expressed their admiration of it as a beautiful marine production; but the most erroneous opinions were expressed concerning its nature. Theophrastus makes mention of it as a precious stone. Pliny speaks of it in his 'Natural History,' as well as of the places whence the fishers procured it: he also alludes to the medicinal properties that were then attributed to it, and to the employment of it as an article of luxury. In his time the Indians had the same passion for grains of coral that the Europeans have since had for pearls. The soothsayers and diviners considered these grains as amulets, and wore them as being ornaments agreeable to the gods. The ancient Gauls ornamented their bucklers and helmets with this brilliant production. The Romans placed pieces of coral on the cradles of newborn infants, to preserve them from the maladies incident to infancy; and their physicians prescribed divers preparations of coral to invalids attacked with fevers, fainting, ophthalmia, and many other complaints.

During the state of barbarism into which Europe was plunged after the fall of Rome, few persons seem to have made any investigations into the nature of coral: it shared the fate of most other departments of natural history: the monks were the possessors of nearly all the knowledge of science then existing, and the closet of the student is not the place in which to study natural history. There does not appear any notice of coral for several centuries in the writings of the few authors who have been handed down to us. Guysonius, a writer of the fifteenth century, seems to be among the first of the moderns who mention coral, and he classes it among mineral productions. This opinion was then adopted by Bocconc; but subsequent observation induced him to give it a place among animal bodies. Tournefort, whose enthusiastic love of botany induced him to rank as a plant every organised substance whose nature was doubtful, considered coral to belong to the vegetable kingdom. At length, about the year 1720, M. Peyssounel, of Marseilles, announced a discovery, the correctness of which has been since fully confirmed, that the coral is an animal of the *Polypus* tribe. Since that period two names have been employed, viz. *lithophytes* and *zoophytes*, to denote these animals, the first implying *stone-plants*, and the second *animal-plants*, arising probably from the strong resemblance which it bears to all three kingdoms; but modern naturalists have agreed in the use of the term *zoophytes*.

The reader must, however, bear in mind that the pieces of red substance which we call *coral* are not, and never have been, really animals: they have once constituted a kind of *bone* or *skeleton*, by which the living insects were supported. Many similes have been used to exemplify the nature of coral: some say that it bears the same relation to the coral-insect that a skeleton does to the human being; some say that the relation is equivalent to that between an oyster and its shell, or a snail and its shell; while others consider coral a sort of nest for the insect; but the analogy is not strict in any of these cases: without instituting a comparison, therefore, between coral and any other organised body, we will proceed briefly to explain the views of modern naturalists respecting the formation of this substance.

"When a branch of living coral," says Poiret, "is drawn up from the sea, it presents a kind of bark spotted with little round tubercles, and covered with a thick adhesive humour, which appears to flow particularly from the summit of the branches, where may be seen large milk-like drops. Plunged again into the water, these tubercles expand, blow, and spread out a star-like substance with eight rays or arms, which M. de Marsigli, and after him many others, seduced by appearances, took for the *flowers* of coral. More recent experiments have demonstrated that these so-called flowers are really animals, armed polypi, lodged in cells situated at the summits and along the sides of the branches." Now it is supposed that this adhesive humour is the material from whence the bark or skin of the branches is formed; and further, that when this bark becomes solidified by age, it hardens into a central core, which then forms the stone-like substance which we call coral. It is in a way somewhat analogous to this that the wood of trees is formed. Each year's growth adds an *external* coating to the substance of the trunk beneath the bark: this coating is comparatively soft; but simultaneously with its formation, an *inner* coating of the same substance is gradually hardening into true wood.

Whatever be the age or the size of a living coral branch, it is always found that there is an inner substance, hard, compact, and capable of receiving a polish; and an outer substance, soft, spongy, thin, and which soon dries when exposed to the air. It is in this spongy bark that are found numbers of little soft whitish polypi, inhabiting small cells. The extremities of the branch are small and tender, and contain very little of the interior substance, all of which is exactly consistent with the

formation of the central coral from successive layers of the viscous humour. The animals are found to possess minute glands, in which is secreted this viscid humour, a humour composed of animal gluten, calcareous earth, and some other substances. Poiret, who paid great attention to the growth of coral off the coast of Barbary, offers a conjecture that this humour may contain the eggs of polypi; and that these eggs either attach themselves to foreign substances, and there form new generations, or they remain fixed upon the paternal branch, grow up into polypi, and live and die there. He proceeds:—"The polypus dies; but in dying it is not, like most animals, submitted to a dissolution which makes it an object of corruption. The death of a polypus is a kind of ossification. It becomes dried and hardened, and remains attached to the branch whence it acquired birth. It appears easy after that to conceive how the coral can insensibly form branches of great extent by layers, both horizontal and perpendicular, of dried and hardened polypi. . . . This matter is augmented by the abundant secretions of the living polypi, and by their envelopes, that is, the cells which they have formed, which, piled one on another, enlarge the branches and form new ones."* Poiret sums up his remarks by saying that a coral is neither an animal, a plant, nor a mineral; but an animal production, the metamorphosis of millions of polypi.

The red coral of which trinkets are made is found in considerable quantities in the Mediterranean, particularly off the coast of Barbary, near Sicily, and off the southern coast of France. It is not found attached to sandy or muddy bottoms, since it always requires a firm rocky bed to adhere to. It springs principally from the inclined sides of submarine rocks, where it shoots forth in the form of a shrub, seldom more than a foot or eighteen inches in length. This coral shrub has a trunk and branches, which vary considerably in diameter, but are still very small. The trunk or principal stem attaches itself so firmly to the rock, that considerable force is required to remove it; and as it is situated far below the surface of the sea, the fishery, or gathering of the coral, is a somewhat laborious employment. This is one of those rude occupations which are conducted nearly in the same manner in all times and in all countries; and Spallanzani's description of the coral fishery in Sicily will pretty nearly represent the present modes of proceeding, both there and elsewhere.

The instrument with which the branches of coral are forced from the rocks is formed with two pieces of wood, crossing each other at right angles, and having a piece of net fastened on the under side to their extremities. A large stone is fixed where the poles intersect each other, that the instrument may more readily sink to the bottom. A cord is strongly tied round the middle of it, one end of which the fisherman holds in his hand, guiding thereby the net to those places where the coral is supposed to grow: the branches of coral are then made to entangle among the meshes of the net, are broken off, and drawn up. This fishery is carried on from the entrance of the Faro to a part of the Strait of Messina, six miles distance. The rocks which produce the coral are situated almost in the middle of the strait, at depths varying from 350 to 650 feet. The bottoms and caverns of the rocks are the places from whence the fishermen endeavour to bring up the coral with their nets. The fishermen have divided the whole tract in which they fish into ten parts. Every year they fish only in one of those parts, from a notion that ten years is necessary to the full growth and perfection of the coral; they say that when they transgress this law, they find the coral smaller and of less consistence, and the intensity of the colour to be proportionate to the number of years they have desisted from fishing.

* Poiret, 'Voyage en Barbarie.'

The coral is generally observed to grow perpendicular to the plane on which it grows, whatever be the position of that plane.

The number of boats employed in the coral fishery off Sicily is said to be about twenty, and the season is from April to July. Each boat is managed by eight men; and the quantity of coral procured is estimated at twelve Sicilian quintals of two hundred and fifty pounds each. The gain acquired is considered adequate to the labour; but the fishery is still only a secondary consideration, since the fishermen only follow it when they have no other employment by which they can make a greater profit. In the coral fishery established off the coast of Barbary, the arrangements were, and we believe still are, as follows:—seven or eight men go in a boat, commanded by the proprietor: the caster throws the machine or net, while the other six manage the boat. The net nearly resembles those used at Sicily, except that two different kinds are employed, one for fishing up the coral where the bottom is smooth, and the other so constructed as to be employed where the bottom of the sea is rocky and unequal. When the fishery is over, the produce is divided into thirteen parts, of which the master-coraller takes four, the caster two, one to each of his six companions, and one for the agents or dealers on shore.

When the coral has been brought on shore, it is separated into different qualities, and devoted to the preparation of necklaces, ear-rings, and other well-known trinkets. The quantity of these worn in Europe is much smaller than those belonging to the Arab and other semi-barbarous people. A great quantity of coral ornaments are manufactured at Marseille, and exported from thence to different ports on the south and east of the Mediterranean, where a ready sale is found for them. With respect to the mode of manufacturing ornaments from a branch of coral, we need merely say that coral, like gems, and many crystalline substances, is cut or ground upon a wheel with the aid of some hard but fine powder: in most of such cases the surface of the wheel is softer and the powder employed is harder than the body which is to be cut.

There are but few things possessing commercial value of which the price varies so greatly as coral. It is stated in Macculloch's 'Commercial Dictionary,' that coral is sold as low as one shilling per pound, and as high as ten guineas per ounce, the latter of which is more than double the price of pure gold. This difference of price results from differences in dimensions, in colour, in compactness, in smoothness, and other qualities. The high price of the best coral has led, as in most similar instances, to the production of a counterfeit coral. This is made of well-beaten cinnabar, a layer of which is applied on a piece of wood, well-dried and polished, first moistened with size, and afterwards varnished with white of egg. This, however, is only one of the various modes in which a rough imitation of coral may be produced.

In this paper we have confined our attention to the comparatively small patches of coral found in the Mediterranean, and used by us for the production of ornaments. The huge coral rocks, reefs, and islands of the Pacific and Indian oceans form a geological phenomenon of too great importance to be adequately noticed in an article like the present.

Genius Uncultivated.—The richest genius, like the most fertile soil, when uncultivated, shoots up into the rankest weeds; and instead of vines and olives for the pleasure and use of man, produces to its slothful owner the most abundant crop of poisons.—*Hume's Essays.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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BRITISH AGRICULTURE.

FEBRUARY.

[Pruning and thinning trees and underwood, showing the forms of the Saxon bills. The medallion at the top shows the winter costume, a hooded cloak, of the Saxon peasant.—The subject selected from Cotton MS. Nero, D. 4; and the ornaments from various Saxon MSS.]

February, although not one of the spring months, agreeably to the arrangement of the four seasons into which the year is divided, yet amongst farmers and agriculturists it is usually accounted such, provided the weather be not more than ordinarily cold and frosty,—inasmuch as it is during this month that many of the farmers commence sowing their spring crops.

> "Go plough in the stubble, for now is the season
> For sowing of vetches, of beans, and of peason.
> Sow runcivals timely, and all that is grey;
> But sow not the white till St. Gregory's day.*
>
> Sow peason and beans in the wane of the moon;
> Who soweth them sooner, he soweth too soon;
> That they with the planet may rest and may rise,
> And flourish, with bearing most plentifull wise."†

We probably may be induced, in our agricultural monthly series, occasionally to introduce extracts from Tusser's 'Five Hundred Points of Good Husbandry.' Although our opinion is, that there is scarcely a practical treatise extant equal to the work in question, or a book upon general agriculture so pregnant with sound common sense, and so full of practical remarks and reflections upon nearly every subject connected with farming,—we are, nevertheless, well aware that upon some points greater science and more general experience have proved Tusser to be in error occasionally; yet when we take into consideration the period at which he wrote his work —now something about two hundred and eighty years ago—this ceases to be at all surprising. The advice he gives, as above, for ploughing in stubble, is decidedly bad; for where farmers at the present day are too indolent or not sufficiently enlightened as to the utility of *cutting* their stubbles early in the autumn, and carting them to the farm-yard for the twofold purpose of their being used as litter and afterwards converted into manure, —if the soil is to be benefited by ploughing in the stubble, that operation ought to be performed several months before the period Tusser here alludes to.

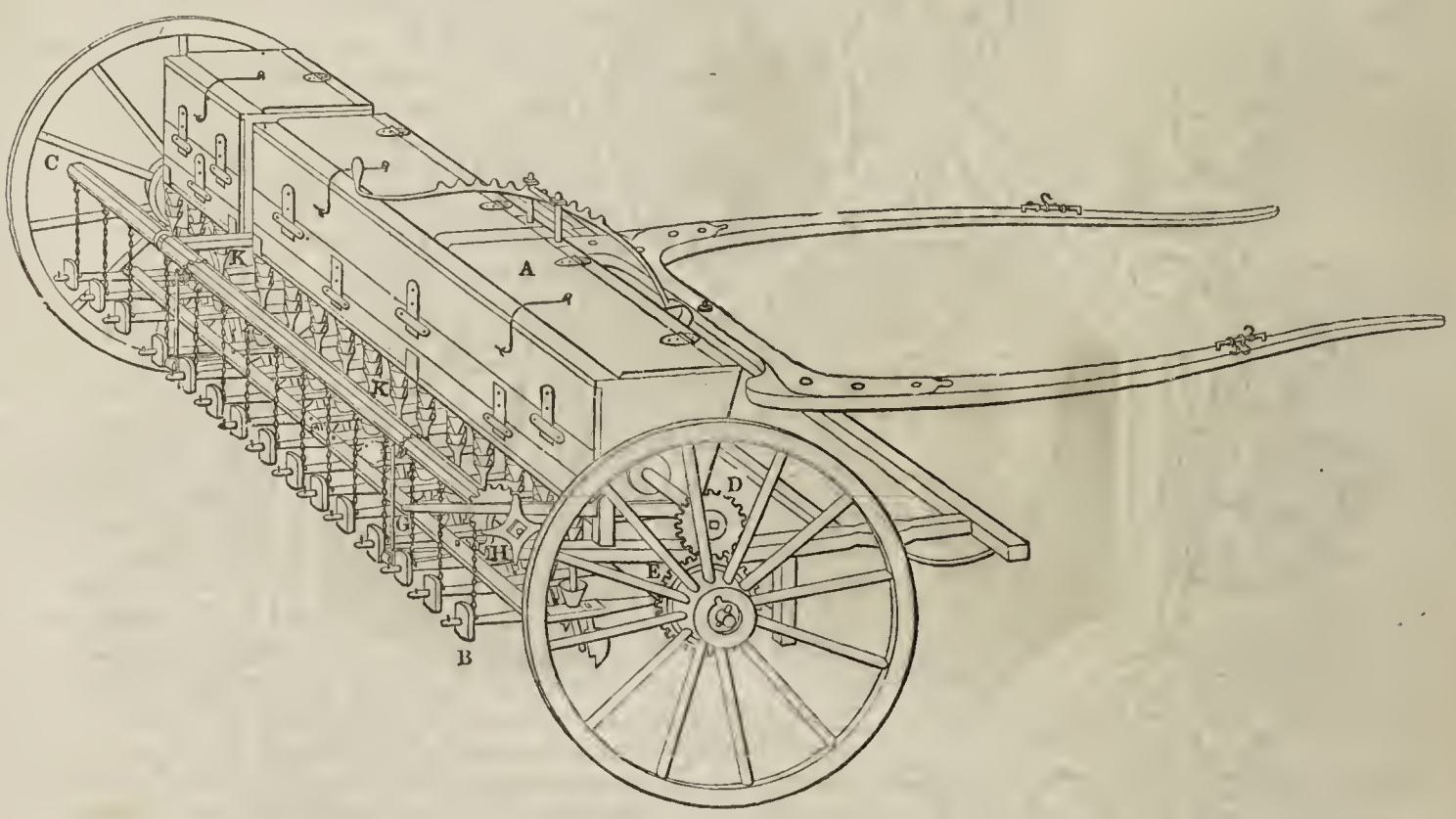
As regards the sowing and planting of certain crops, in particular periods of the moon's age;—notwithstanding the opinions Tusser expresses in this and some other parts of his 'Five Hundred Points of Good Husbandry," but few of our farmers at the present day pay any attention to *lunar* influences; although on various parts of the Continent the farmers still suffer themselves to be greatly inconvenienced by waiting for certain days, or periods of the moon's age, before they consign the seed to the bosom of the ground, in a full hope and con-

* St. Gregory's day occurred formerly on the 24th of March. Our ancestors were accustomed to regulate many of their actions by the Saints' days.

† Tusser, Feb. Husbandry.

fidence of receiving at the appointed time the due reward of their labours. The Americans, too, mostly regulate their sowing and planting, at least of various kinds of grain and pulse, by the age of the moon; notwithstanding that they affect to consider themselves much less under the influence of vulgar prejudices and ancient superstitions than European nations generally are.

Should the weather prove favourable in the latter part of this month—that is, should it be sufficiently dry to bring the soil into a proper state for the reception of the seed—barley-sowing is commenced in some parts of the country; although in March, and, indeed, sometimes in April, a considerable breadth of the barley-lands receive their seed. Now is the season for sowing beans and peas; and although they are often sown broad-cast, or under-furrow and ploughed in, beans are more frequently drilled, and occasionally dibbled, that is, planted in holes made by the hand. The system of drilling several sorts of crops was very little practised in England considerably short of a century ago; and into many isolated districts the drill has not been introduced up to the present period. These, however, can scarcely be called farming districts, since the small farms of which they are composed continue to be cultivated, if such a term can properly be applied to the wretched system of tillage, precisely in the same manner they were two or three generations ago. The introduction of the turnip husbandry was a means of making drills more generally used; and as this system of sowing was found by the more enlightened farmers to possess several advantages over the ordinary broad-cast method, farmers at all ambitious of keeping pace with modern improvements in agriculture were not slow in adopting the drill. There are, however, soils that the drill cannot be profitably used upon, for seeds generally



[Suffolk Patent Drill.—A, seed-box; B, a weight fixed to each coulter to press it into the ground, and to adapt it to all the inequalities of the soil; C, cyliuder round which the coulter chains are wound when the drill is moved from place to place; H, haudles and racket-wheel, to prevent the chains unwinding; D, wheel turning the cylinder, which has the cups fixed to its circumference. When the drill is used, the box A is filled with seed, and the slide in it so adjusted as to supply it regularly; the lever G is raised, and the wheel D connected with the wheel E. As the horses proceed, the cylinder turns, the cups take up the seed, and throw it into the funnels K, K, which conduct it to the drill behiud the coulter.]

sown by the drill require the soil, at the period of sowing, to be in a pulverised state, else the common drill cannot operate in the way it was intended. Evelyn, in a work of his upon improved agriculture, claims for himself the invention of the drill. But his was a rude and imperfect implement, and as much unlike those of the present day (for we now have them of various kinds and patterns) as it is possible to conceive two implements bearing the same name to be. Many farmers, where the soil is in fine tilth, sow their wheat and barley crops with the drill, as well as their turnips, carrots, &c. Some artificial grasses, particularly lucerne and sainfoin, are sometimes sown by the drill, that is, in rows, the advantage of which is this—that it permits the soil being stirred between the rows with a horse-hoe, which cannot be done when the seed is sown broad-cast. When corn is dear, there is a saving effected in sowing with the drill, less seed being required; but the system of dibbling requires the least seed of all, for then the grains are equally distributed, none of them crowding one another, nor a considerable portion of them left uncovered and thereby lost, while some are buried so deep that they rot in the ground. All sorts of seeds do not, however, rot in the ground, though they lie dormant and do not vegetate. Mustard for instance is one of these, for it has frequently

[Dibbling.]

been affirmed, and is generally believed, that a field in which mustard has once been cultivated, though it should be laid down to grass for a century, when it is ploughed up at the expiration of that period, a considerable quantity of the seed which had been shed while crops of mustard were cultivated, will arise among any other crop that may be sown upon the ground; and what appears more singular than this even often occurs when moors or waste lands are first enclosed and cultivated. Take for instance a dry piece of heathy ground, or a wet piece and drain it, where for centuries, if not from the beginning,

no grass ever grew, burn off the heath, plough it several times, and manure it well with lime, and let no grass-seeds be brought near it, yet in a few years many sorts of grasses will spring up, and amongst them vast quantities of white clover. How is this? Here is a problem to solve for the philosophical agriculturist.

> "Now thresh out thy barley, for malt or for seed,
> For bread-corn, if need be, to serve as shall need:
> If work for the thresher ye mind for to have,
> Of wheat and of mestlin, unthreshed go save."*

As we have already hinted, the general management of farms and crops has altered so materially since the days of our poet-farmer, that we cannot invariably consult him as a text-book. We find that he advises, at this particular season of the year, the threshing out of barley "for malt or for seed," which is the general custom amongst farmers at present. But the use of barley as bread-corn is wholly dismissed from the midland and southern counties (those with which Tusser seems to have been acquainted), and confined to a few limited districts where wheat is little (if at all) cultivated in the hilly and less fruitful parts of the country. Mestlin (mastlin), which signifies mixed corn, but generally wheat and rye, is now but little cultivated; since those who prefer bread made of a mixture of these two sorts of grain can have no difficulty in attaining their object without mixing the seed when it is committed to the ground.

Having introduced the subject of threshing, it may not be out of place to observe that, considering the vast extent of labour-saving machinery which has been introduced into almost every department of trade and manufactures, it is somewhat remarkable how little has been effected in this way among farmers and agriculturists; for except the threshing-machine (and there are various sorts), there has not any implement been introduced that materially lessens the employment of farm-labourers. The horse-rake, the draining-plough, and many other things have been invented that benefit the farmer, but none in an equal degree to the threshing-machine, where three or four horses, with two men and a boy, will perform more work (and better too) than a score of ordinary threshers. Threshing-machines also set men at liberty to hedge and ditch, and do other necessary and useful farm-work. And yet, except in certain rural districts, these machines have not become general. In some places the labourers became so incensed at their introduction, that they rioted and demolished several of them; although there are few sorts of labour more irksome to the peasantry of the agricultural districts than threshing, particularly barley, the beards of which are prickly, and very annoying to the thresher; but then it is in-door work, and furnishes employment in stormy weather and when the labourers would not be so easily able to get employment at other work.

> "Though, night approaching, birds for rest prepare,
> Still the flail echoes through the frosty air,
> Nor stops till deepest shades of darkness come,
> Sending, at length, the weary labourer home."†

Besides the two great features in farming, namely, the cultivation of arable and grass farms, there are also some others applicable to particular districts of England, amongst the chief of which may be considered the cultivation of hops and apples. These, however, are principally confined to the counties of Kent, Sussex, Hereford, Somerset, and Devon; the three first-named comprising the chief hop districts, and the two last (including Hereford) comprehend the principal districts where cider is manufactured to any considerable extent. But since the present season of the year does not apply peculiarly to the cultivation of hops, nor at all to cider-making, some notice of these matters may be more appropriately introduced at another period of the year. However, apple-orchards, and orchards in general, that may have been neglected in the latter part of autumn, will now require some attention where the owners perform their duties towards them, and hence a few words upon their general management will not be out of season.

> "Good fruit and good plenty doth well in the loft,
> Then make thee an orchard, and cherish it oft;
> For plant or for stock, lay aforehand to cast,
> But set or remove it ere Christmas be past."*

Most of the principal apple-orchards in the cider counties belong to farms of a considerable size, where the cultivation of grass or grain, or of both conjointly, becomes a matter of higher consideration with the farmer than his apple-crops; and this, in some degree, may account for the way in which great numbers of the orchards are neglected; for there seems little reason to doubt the fact that the majority of apple-orchards are attended to in a careless or slovenly manner. In the first place, then, many very indifferent sorts of fruit continue to be planted as the old stocks wear out; which may be divided into two classes, namely, bad bearing trees and trees producing poor qualities of apples. For management like this there is no excuse, since the trouble of cultivating good and bad fruit is precisely the same. Since apple-orchards in general are occasionally ploughed and tilled, one would imagine that due care would be taken in planting them to have the trees placed at a convenient distance asunder, for two reasons; first, that crops of grain or vegetables might be cultivated with greater facility; and, secondly, that the sun's rays should not be totally shut out from ripening the crops in the ground, as well as from the fruit growing upon a large portion of the branches. Another piece of bad management apparent in many of the apple-orchards is this: while young, the trees are suffered to retain many of their collateral branches so near the ground, that farm-stock is apt to destroy no inconsiderable portion of the apple-crop; while the lowness of the limbs, when the trees become of a sturdy strength, renders it difficult, if not wholly impracticable, to cultivate the soil in a proper manner.

Considerable difference of opinion still exists regarding the best season for pruning fruit-trees, or rather, perhaps, for pruning the cider and perry orchards. Some assert that pruning should be done immediately after the leaves fall from the trees—about the beginning of November; but it is more generally performed in the latter part of January or during the present month. Pruning is often very indifferently done, or but half executed; either the superfluous branches and shoots are taken off in a slovenly manner, or not to a sufficient extent. When trees are "hacked and hewed" in a careless way, it usually happens that a portion of the bark is injured, and hence the regular flowing of the sap is partially deranged. Old trees that have too much bearing-wood left in them, even in a good apple-season, yield but small fruit; whereas if a proper quantity of the branches already in a state of partial decay, and such as grow athwart each other, were taken away, the size as well as the quality of the apples would be considerably improved. Undoubtedly it is possible to prune orchards too much, but a great majority of them are pruned too sparingly.

There are few inns in any part of England where the traveller cannot, if he please, be accommodated with bottled perry or cider, and yet beyond the limits of the cider-producing districts it is comparatively but little drank by any class of persons. Within the cider counties, however, it is the common beverage, taking precedence of malt liquors, the inhabitants generally preferring good cider to the best ale and porter that are brewed. This seems to be the effect of habit rather than in accordance with the national taste; for out of those districts where cider can be had as cheap as the cheapest porter or ale,

* Tusser, Feb. Husbandry. † 'Farmer's Boy.'

* Tusser.

scarcely one person in a hundred patronises the juice of the apple, showing a decided preference for John Barleycorn.

In our supplementary number of last month we presented our readers with the specimen of a journal, such as we considered it would not only be useful but interesting for farmers and others to keep; and although, as we stated, we profess to have no faith in the predictions of almanac-makers, our knowledge of a country life and rural affairs enables us to bear testimony to the utility (on some occasions very great) derived from a due observance of meteorological appearances, as well as from the movements and actions of the flocks of sheep and cattle, to which nature seems to have imparted a peculiar foresight in regard to approaching storms or changes in the weather generally; and indeed almost all the animal creation teach useful lessons to the observant and intelligent farmer:

"But if observ'd the quick-revolving sun,
And moons that duly in their order run,
Ne'er shall to-morrow's dawn deceive thy care,
Nor a mild night surprise thee by its snare.
Mark Luna with collected fire return;
If darkness warp within her clouded horn,
A storm immense will burst upon the main,
And farmers feel the unremitting rain." *

Thus it was, in the days of the Roman poet, that persons employed in agricultural pursuits were in the frequent habit of consulting heavenly appearances; and he energetically exclaims,

"Who dare pronounce prophetic Sol deceives?" †

And again,

"The sun both signals at his rising gave,
And when he dipped his fire in ocean's wave;
Signs most unerring on the sun attend,
When morn breaks forth and stars their lustre lend;
When wrapped within a cloud the early sun,
Varied with spots, and half his orb withdrawn,
The rain expect, for Notus from the seas
Threatens the corn, the cattle, and the trees.
* * * * *
But if the sun with lucid orb appear,
His morning bright, his disk at evening clear;
In vain the showers you dread, for now are seen
The waving woods with northern blast serene." ‡

Tusser, in his work upon "Husbandry," gives a description of the properties of winds, and concludes with the ancient adage and truism—"It is an ill wind that blows nobody good." Of the winds during the winter season he says,

"North winds send hail, south winds bring rain,
East winds we bewail, west winds blow amain;
North-east is too cold, south-east not too warm,
North-west is too bold, south-west doth no harm."

"Feb., fill the dyke with what thou dost like.
Forgotten month past, do now at last." §

In many parts of our island this is considered a more uncertain month than its predecessor or the one that succeeds it; and in some parts of England the farmers have a somewhat different version of the character of the month than we find in Tusser; it runs thus:

"February, fill dyke either with black or white,"

that is, either with floods of rain or wreaths of snow. As for his advice regarding work that was forgotten during the last month, it can scarcely be taken in a literal sense, for farmers do not often *forget* necessary and ordinary farm-work; but it would rather seem to imply that now is the time for performing that which would better have been performed during the last month, had circumstances permitted it. Some seasons the weather is fine; and March dust, a peck of which in olden time was considered so valuable as to be worth a king's ransom, is occasionally to be met with during the month of February. The meaning of this proverb is sufficiently obvious to persons acquainted with agriculture; for when the weather at this early season of the year is so dry that the soil becomes dust, it is an evidence that the farmer has had a long succession of favourable days for getting the ground into excellent condition for the reception of early spring crops.

"The dust of winter fills the corn with joy." *

The carolling lark now begins to salute the early ploughman with its joyous matin song; and the mellow notes of the blackbird rejoice the heart of the shepherd while at eventide he guides his bleating flock to some place of shelter and safety:—

"Thus pass'd the time,
Till through the lucid chambers of the south
Look'd out the joyous spring, look'd out and smiled." †

However, in the lowland plains, and among the more fertile parts of the country, with the shepherd and the sheep-farmer this is a peculiarly anxious time of the year, for it is the season when the teeming ewes bring forth their lambs; and should there be snow upon the ground, or the nights frosty, or even should it be cold and rainy, unless unwearied care and attention are bestowed upon the ewe flocks, a considerable loss among the lambs is sure to take place. Even with the best management,

"Casualties and death from damps and cold
Will still attend the well-conducted fold:
Her tender offspring dead, the dam aloud
Calls, and runs wild amidst th' unconscious crowd;
And orphan'd sucklings raise the piteous cry;
No wool to warm them, no defenders nigh." ‡

It frequently happens, amongst flocks of sheep, that some of the young ewes that have never produced lambs before, refuse to act a parent's part; in short, they desert their tender and helpless progeny. Such lambs, or others belonging to ewes that have produced twins, but have not sufficient nourishment to support them, are sometimes placed under foster-mothers, means being adopted to cheat them into a belief that the little strangers are their own progeny.

Many farmers continue to fold their ewe flocks upon their fallows even during the lambing season, imagining they gain more by thus improving the soil than any loss they may sustain in the death of a few lambs. But this is, to say the least of it, a barbarous practice; for should the weather be cold and wet, those lambs that escape being lost in the dirt and mud will continue for a considerable period miserable looking objects. Besides, some of the ewes suffer so much pain and fatigue in yeaning, that they equally stand in need of a place of comparative comfort and shelter from the bitter blast with their young and tender offspring. Farms under the improved system are now commonly provided with small enclosures and suitable buildings adjoining for the ewes and young lambs to be sheltered in.

At this particular season, therefore, the shepherd's cares and toils do not cease at day's decline, since it is his duty, if he performs it aright, to quit his humble couch during the midnight hours to suckle the young and weakest of the lambs, which are not able of themselves to obtain necessary nourishment from their dams; and to ascertain that all are safe and in places of warmth and shelter. In many countries, the shepherds and their trusty dogs have to be on the watch the livelong night, and even in Britain our ancestors of olden times were exposed to the same dire necessity; for then

"Cruel in death, and hungry as the grave,
Burning for blood, bony, and gaunt and thin,

* Virg., 'Georgics,' book i.
† Virg., 'Georgics,' book i.
‡ Virg., 'Georgics,' book i.
§ Tusser.

* Virgil's 'Georgics.'
† Thompson's 'Seasons.'
‡ 'Farmer's Boy.'

Assembling wolves in raging troops descend,
And pouring o'er the country, bear along,
Keen as the north wind sweep the glossy snow,
All is their prize." *

Be the season mild or otherwise, as yet the pastures yield no supply of herbage; hence all sorts of farm-stock have to be fed upon the produce laid up in store for them. Ewes and fat sheep are now mostly fed upon hay and turnips; lean cattle for the most part upon straw (arable districts are here alluded to); cows yielding milk and cattle intended for the shambles, upon hay and turnips, and occasionally oil-cakes (either of rape or linseed); and horses principally upon hay, chopped straw, oats, and beans. The custom of chopping straw for horses is comparatively of modern date; and although the straw-cutter has been found effecting so great a saving in horse-keeping, there are still many parts of the country where it is not used at all. Cabbages and mangel-wurzel are partially cultivated in some places as substitutes for turnips, particularly to feed milch cows upon; while carrots are not only given to cattle, sheep, and swine, but also to horses, which appear to relish them much. But as the general cultivation of carrots and cabbages will be spoken of in another place, we shall forbear any further remarks at present.

Again we cannot refrain from referring to the contented and happy condition of the farmer; and if we were asked, where we would go in quest of a picture where the faces of the whole assemblage of figures should be ruddy with health, and beaming with smiling contentment, we would answer, to a market-table or ordinary where thirty or forty intelligent and respectable farmers weekly meet and dine together, and over their good and plentiful fare discuss the various subjects connected with agriculture, particularly what comes within the limits of the local district they may be said to represent. Unlike noisy politicians, they are not all intent upon talking at once, for they feel quite satisfied in receiving and imparting such useful information as they may chance to possess. Neither do they waste hour after hour in wrangling and noisy debate, nor in abusing their health by deep and oft-repeated potations; for, one hour after the removal of the cloth, a majority of them will have absented themselves to transact some business they had left unconcluded before dinner, or, mounted on horseback, or in their vehicles of various descriptions, be on their way homeward,—*home* being to them a term fraught with many endearing associations. The class of farmers from which we would propose sketching our picture is composed, for the most part, of individuals whose circumstances in life place them above any serious misgivings about the failure of a single crop, or a fall in the market prices of farm produce; for where men are in narrow or needy circumstances, living, from month to month, and from year to year, under the constant apprehension of some change in the times that would certainly work their utter ruin, their looks will undoubtedly at times betray their anxious feelings and fearful apprehensions. Often have we delighted to join those happy groups, in various parts of the country, and we do not remember ever separating ourselves from their society without entertaining an increased reverence and respect for that truly noble national character—an independent English farmer; for it is to him, in the strictest sense, that the following passage might be addressed :—

"God has not given
This passion to the heart of man in vain,
For Earth's green face, th' untainted air of Heaven,
And all the bliss of Nature's rustic reign.
For not alone our frame imbibes a stain
From fetid skies, the spirit's healthy pride
Fades in their gloom." †

* Thompson's 'Seasons.'
† Campbell, on revisiting a Scottish river.

We are also decidedly of opinion that farm-labourers, taken as a whole, are the most contented and happy body of persons that earn their daily bread by the labour of their hands, to be met with in this country. Not that, in very many instances, they are better off, or even so well to do as some other classes of the lower orders; but their ideas and associations do not lead them into those situations of uneasiness and excitement common to manufacturing populous communities. Generally, however, they are far from being liberally treated by their employers, for when farm produce is at a low rate, the farm labourer's wages are proportionately low; but when the markets advance 60 or 70 per cent., the wages of the labourer are rarely advanced in anything like a corresponding degree, although three-fourths of their wages are the products of the soil. And yet they seldom repine or grumble; they have no aspirings beyond their lowly dependent condition, nor any wish to roam beyond the confined limits of their early local associations.

Respecting *farming*, it cannot be carried on without capital, no more than any business of a commercial character; for there is the stocking of the farm, paying of wages and rents, and many other expenses, before almost any profits are derived from the soil. Were farmers inclined to be dishonest, their affairs seldom afford them the means of mystifying matters in the way we sometimes find attempted in trade and commerce; for when a farmer's funds run short, his crops, farm-stock, implements, and furniture, commonly include the sum-total of his effects; the value of which can readily be estimated by any one of his neighbours. And there cannot be a doubt that where circumstances render it a difficult matter to deceive, that attempts at deception are proportionably rare, and hence it probably follows, that we find *honest* so generally coupled with the term farmer. But few farmers set out in life with the hope or expectation of realising large, or, indeed, moderate fortunes; nor do they look forward to retiring from business after a certain period, which is so generally the case with those engaged in commercial business. On the other hand, where common prudence is exercised, few farmers need apprehend the probability of spending the evening of their days in want and penury. Should reverses of fortune, however, come, here is the excellent advice of the poet,—

"Though Fortune smiles, and fawns upon thy side,
Thyself extol for that no whit the more;
Though Fortune frowns, and wresteth all things wide,
Let fancy stay—keep courage still in store:
For chance may change, as chance hath done before;
Thus shalt thou hold more safe thine honour got,
Or lose the less, though Fortune will or not." *

Tusser, as we have already observed, published a poetical treatise, in the sixteenth century, upon farming and farming matters, which he calls 'Five Hundred Points of Good Husbandry.' But he does not confine his work precisely to matters to be done on the farm, for he goes through the whole range of domestic and household duties incumbent on a country and pastoral life. In this latter department his maxims and sentiments prove themselves the dictates of experience, suggested by good sense. The following are quoted from what he names 'Good Husbandly Lessons.'

"As bud, by appearing, betok'neth the spring,
And leaf, by her falling, the contrary thing;
So youth bids us labour, to get as we can,
For age is a burden to labouring man."

"A competent living, and honestly had,
Makes such as are godly both thankfull and glad.
Life, never contented, with honest estate,
Lamented is oft, and repented too late."

"Count never well gotten, what naughty is got;
Nor well to account of, which honest is not:
Look long not to prosper, that weighest not this,
Lest prospering faileth, and all go amiss."

* Tusser.

Of farmers we have several grades;—first there is he who rents a few acres, the whole of which he tills or cultivates with his own hands. Then we have him who occupies a little more than he can cultivate himself, and hence he is occasionally under the necessity of employing a labourer or two; but when he does so, he himself takes the lead in whatever sort of work has to be performed. These may properly be called *working* farmers; and in all those districts where the land is principally owned by small proprietors,—and where estates are much intermingled,—these two varieties constitute the most numerous class of farmers; for even where the owners of small freeholds reside upon the farms themselves, they find it necessary to labour, if they would steer clear of debt and difficulties. Next we have a class of farmers who superintend, for the most part, the labour of others; but who occasionally lend a helping hand when something particular has to be executed, or when there is a scarcity of hands to complete some job of work in due season. For the most part this class is composed of the sons of respectable farmers, who, during their youth, had been taught to take an active part in farming affairs; and who, therefore, occasionally consider it no hardship nor degradation to practise their early habits. Farmers of this description usually rent farms of 100*l.* or 200*l.* a year. Then we have a class that rent farms of double the amount, who never condescend, on any occasion, to lend a helping hand; their whole employment consisting in overlooking others, in attending markets, and in ascertaining that everything is duly and properly executed. Next we have a still more wealthy and independent class, generally called *gentlemen* farmers, composed of persons of considerable property, who either rent very large farms, or farm pretty extensively upon their own property. Many individuals of this class do not condescend to look after the common drudgery concerns of farming, employing bailiffs or head-men to superintend under them, but who consult their superiors upon all the principal affairs of the farm that from time to time present themselves. There is yet another class, but they can hardly be considered as coming under the general head of farmers; we refer to noblemen and gentlemen of independent fortune, many of whom feel a deep interest in agricultural affairs, and who have greatly assisted in advancing it as a science. These, however, do not make farming a *business*, but resort to it for sober and pleasant recreation; and where, it may be asked, would they be so likely to have their wishes gratified?

The origin of a class of tenant-farmers in any country marks a period of the utmost importance in its history. When this change occurs, the composition of society becomes more complicated, and new combinations and interests are developed, such in fact as exist in England at the present day. But previously the owners and cultivators of the soil formed the two great divisions of the community, and artisans were comparatively few in number and comprised only those engaged in the most necessary arts; for the absence of wealth—of capital or accumulated resources—lies at the foundation of this state of things. The landowner is not rich enough to advance funds for the support of the labourer, nor does there exist any other class who are enabled to do so; and the labourer therefore extracts his wages directly from the soil, working a part of his time on land for the use of which he is engaged to work the remainder of his time for his lord. This is the present condition of agricultural industry in Russia. But when the results of labour have accumulated, and capital has become abundant, persons possessing a share of this accumulated stock engage in the cultivation of land, and they are rich enough to advance the labourer's wages in money, while a condition of this change is, that there exists a surplus which accrues to the landowner as rent, and he may now live upon this revenue without personally directing the labours of the cultivator. The increase of wealth is the sole cause of this alteration, though the process by which the peasant is detached from the soil and becomes a free labourer, and the direction of agricultural industry is changed and passes into the hands of a class of capitalists or tenant-farmers, is in some respects a painful transition. In England this change was wrought out between the reigns of Henry VII. and Elizabeth. As this era is one of so much importance in our social history and in the history of agriculture, we are induced to devote more space to it now than, in busier months of agricultural labour, it would be in our power to afford. The reign of Henry VII. commenced in 1485, and Elizabeth's closed in 1603, a space of 118 years. The following review of the changes to which we have alluded as occurring within this period is from the 'Pictorial History of England:'—

At the beginning of the period, the yeomanry usually lived in a dwelling of timber, the walls of which were formed of wattled plaster. It had not always a chimney, and contained few conveniences. They slept on straw pallets, covered with a sheet and coarse coverlet, or perhaps upon a flock mattress and a bolster of chaff. Their servants slept upon straw, and had not always a coverlet to throw over them. All dined off wooden trenchers and ate their pottage with a spoon of the same material. Even a substantial yeoman did not possess more than four or five pieces of pewter plate, and the sum of money which he could raise was insignificant. Harrison says, that if a farmer or husbandman, in his cups at the alehouse, could pull out a purse containing six shillings, an equal sum could not perhaps be raised by the whole of his companions, who were of the same rank as himself. Only the gentry could afford to eat wheaten bread the year through. The servants and the poorer class of people ate bread made of barley or rye; and in dear years their bread was made of beans, peas, or oats, or perhaps of all these together. In periods of still greater scarcity, artificers and labouring men had no better nourishment than such as tares and lentils supplied. Hence the proverb of those times, that "hunger setteth his first foot into the horse-manger." For clothing, the rustic housewife spun, from the wool and flax produced on the farm, sufficient cloth and linen of coarse texture for the use of the family, though Fitzherbert, to whom we owe the first English work on husbandry, writing in 1522, even in that day acknowledges that it was not profitable for a woman wholly to devote herself to the distaff; but, as he remarks, "it stoppeth up a gap, and must needs be had." According to this old writer, the farmers' wives must have been patterns of diligence and industry, and a variety of duties devolved upon them which have since ceased to be required, or have fallen with more propriety upon the other sex. They had to measure out the quantity of corn to be ground, and see that it was sent to the miller. The poultry, swine, and cows were under their charge; and they superintended the brewing and baking. The garden was peculiarly the care of the farmer's wife. She had to depend upon it for various herbs which are no longer in use, but which could not be dispensed with when spices were rare and costly. Besides pot-herbs, strewing-herbs were required for the chambers, and herbs possessing medical virtues. The list of fruits at this date was confined to a few of indigenous growth, which were but little improved by skill and management. Tusser directs his housewife to transplant into her garden wild strawberries from the woods. All the writers on rural economy during this period recommend the farmer's wife carefully to attend to her crop of flax and hemp. When, however, Fitzherbert asserts that it is a wife's duty "to winnow all manner of corn, to make malt, to wash, and to make hay, shear corn, and, in time of need, help her husband to fill the muck-wain or dung-cart, drive the plough, to load hay, corn, and such other, to go to market and sell butter or pigs, fowls or corn," it is to

be presumed that he had in his view the smallest class of yeomen, who had no hired servants.

Such were the general circumstances of the life and condition of the country population during the first years of this period. Harrison asserts that, notwithstanding their frugality ("if," as he shrewdly observes, "it may be so justly called"), "they were scarce able to live and pay their rents at their days without selling of a cow or a horse, or more, although they paid but 4*l.* at the uttermost by the year." This want of money for the payment of their rents, however, was probably their greatest want. They seem to have enjoyed the principal necessaries of life in rude abundance; and on the whole, when we know that at the end of the fifteenth century land was generally underlet, and when the mode of life which prevailed is taken into consideration, we cannot but presume that the yeomanry were not so badly off as Harrison describes them. The farmer of these times himself consumed the chief part of the produce which he raised, his servants taking their seats at his table. Luxuries were unknown, and the principal materials for clothing were not bought, but were obtained by the industry of each family. The instruments of agriculture were so simple, that many of them were made, or at least kept in repair, by the farmer himself. Every yeoman was expected to know how to make yokes, ox-bows, and plough-gear. Such work afforded profitable employment in the winter evenings; and, if nothing of the kind needed to be done, the alternative recommended by Fitzherbert was, to go to bed, in order that fire and candle might be saved. Considerably later, in Tusser's time, sole-leather was kept in farm-houses, with which shoes might be mended as occasion required; and, looking generally at the circumstances of the rural population, it may easily be seen that the causes which render agriculture purely commercial in all its objects were not very strongly developed.

After the commencement of the reign of Henry VII. and before the general rise in rents which took place in the succeeding reign, England must, on the whole, have presented more of such pictures as that which Latimer has drawn, in one of his sermons, of the condition of his father, than of such as resembled the description Harrison gives of the difficulties, bordering upon wretchedness, of the yeomen to whom he has alluded. Latimer's father was a yeoman, but had no land of his own. The rent of his farm was under 4*l.* a year, yet he had as much land under tillage as kept half a dozen men and a hundred sheep and thirty cows. He found a horse and man for the king's service when called upon. His son he sent to school, and afterwards to college; and on the marriage of his daughters, he gave 5*l.* to each as a dower. He was besides hospitable to his neighbours, and gave alms to the poor; "and all this," Latimer asserts, "he did from the said farm." But soon after the commencement of the reign of Henry VIII. the indications of approaching social changes begin to appear, and in the time of his son and successor, we find the farmer in new circumstances. Latimer tells us, that now the person that had his father's farm paid for it 16*l.* by the year, or more, and was not able "to do anything for his prince, for himself, nor for his children, nor to give a cup of drink to the poor." Generally, he says, in the course of a few years, rents had increased from 20*l.* to 50*l.*, or more than doubled. The farm on which a yeoman of small means could live when the money-payments for rent and labour were inconsiderable, therefore became insufficient to maintain him. "Hence," says Ascham, "so many families dispersed—so many houses ruined. Hence the honour and strength of England, the noble yeomanry, are broken up and destroyed." The numerous enclosures which now took place rendered the case of the yeoman-cottager hopeless, unless he became a day-labourer. Latimer, in his sermons, loudly denounced the changes which were taking place. His views were those of a benevolent man, and they were extremely popular, but there had not been wanting others who pointed out with great clearness the advantages of enclosures. Fitzherbert shows how a township that is worth twenty marks a year may be worth 20*l*, and the groundwork of his plan is to enclose the land. "By enclosing," he says, "a farmer shall save meat, drink, and wages of a shepherd; the wages of the swineherd, the which may fortune to be as chargeable as his whole rent; and also his corn shall be better saved from eating or destroying by cattle." To the objection that many men would lose their ordinary means of maintaining themselves, he replies:—"There be many new occupations that were not used before, as setting of quickset, ditching, hedging, and plashing." In another work, written sixty years afterwards, it is expressly stated that "the counties where most enclosures be are most wealthy, as Essex, Kent, and Northamptonshire, &c." It happened also at this time that, while some of the old landowners had been compelled to sell portions of their estates, persons who had enriched themselves in trade became the purchasers, and settled upon their property, looking upon the business of farming with a commercial eye. King Edward, in his Journal, sneers at these "clothing knights," and observes, "this country can bear no merchant to have more land than 100*l.* a year." Edward notices, in his Journal, some of the most striking symptoms of the state of transition through which the country was now passing. Speaking of the gentry, he says, "their house-keeping is dearer; their meat is dearer; their liveries dearer; their wages greater." And he adds, "merchants have enhanced their ware; farmers have enhanced their corn and cattle; labourers, their wages; artificers, the price of their workmanship; and mariners and boatsmen, their hire for service."

Another change which greatly affected the condition of the agricultural population was, the extensive conversion that now took place of tillage into pasturage. It was a popular saying, that "it was never merry with poor craftsmen since gentlemen became graziers." These gentlemen graziers also, instead of residing upon their estates in the country like their forefathers, are stated to have very generally betaken themselves to court or to town, and there lived, in the best way they could, upon the produce of their sales of wool and cattle. But the gentry were compelled to this step through the insufficiency of their revenues to defray their former bountiful mode of living. "Some," was the popular complaint, "get them chambers in London or about the court, and there spend their time, some of them with a servant or two, where he was wont to keep thirty or forty persons daily in his house." The legislature vainly endeavoured to arrest the progress of these changes, which were taking place in the occupation of the land. They passed acts to prevent the engrossing of farms into few hands; to restrict the number of sheep kept by one grazier; to keep land in tillage and farm-houses in repair. In 1588 penalties were imposed upon the building of cottages for the agricultural population without having four acres of land attached to each, or allowing more than a single family to live in one cottage. Many poor people, it is stated, had become "wanderers, idle, and loose." The act of 43 Eliz., for the relief of the poor, was the great attempt to cure these evils. As to the statutes relative to keeping land in tillage, and for the maintenance of houses of husbandry, Hume is of opinion, from the frequency with which they were enacted, that they were never executed.

But, however painful were some of the immediate effects of these changes, their operation, on the whole, was highly beneficial to many important interests, especially to agriculture. Harrison states that the soil had become more fruitful than in times past, and assigns as the cause, that "our countrymen are grown to be more painful, skilful, and careful, through recompense of gain, than

heretofore they have been." One acre produced now as much as two did formerly. Norden, who wrote towards the close of the period, speaks of the additional attention paid by husbandmen to the manuring of their lands. The average yield of corn in Harrison's time was, on each acre well tilled and dressed, twenty bushels of wheat, thirty-two of barley, and forty of oats and pulse. The breed of live-stock partook of the general improvement. Cattle, from having been so scarce as to call for various statutes to prevent the killing of weanlings, were now in great abundance. Harrison asks, with some exultation, "Where are oxen commonly more large of bone, horses more decent and pleasant in pace, sheep more profitable in wool, swine more wholesome of flesh, and goats more gainful to their keepers, than here with us?" The people, on the whole, appear to have been gainers by the alterations which had been effected; and in many respects the change was from a desultory and idle life to a course of diligence and industry. They consumed a good deal of flesh-meat, and were fond of entertaining each other with good cheer. Harrison says that lard was not much used, "sith we do baste all our meat with butter, or suffer the fattest to baste itself by leisure." Such are the vaunting terms in which this old writer speaks of the diet of the people after the middle of the sixteenth century.

But it was not only in the diet of the agricultural population that, by the close of this period, improvements had taken place; a decided advance in comfort was also apparent in their habitations and furniture. The houses began generally to be built of brick or stone; the rooms were more airy and capacious, and the outbuildings farther removed from the dwelling. In proof of their easy circumstances, the farmers could point to some articles of silver plate in their cupboards; to the pewter plates which had superseded their wooden trenchers; and the coarse mattress and bolster were replaced by good feather-beds. The substantial yeoman, besides being surrounded by additional comforts, had often several years' rent in hand. Some of these changes are lamented by Harrison, who remarks that when the walls of houses were of wattled willow we had oaken men, but that they were become effeminate with the increase of luxury—a complaint which has been made in every age of that which preceded it.

The rotation of crops usually followed during this period indicated but little advancement in the art of agriculture. After a crop of wheat or rye, they sowed barley or oats in the spring, and then came a fallow. Clover was, however, introduced in the reign of Elizabeth from the Netherlands. Its great value consisted in supplying green food where natural pastures were scarce; in enabling the farmer to keep more cattle, and consequently to apply a greater quantity of manure to his land. It could not effect that improvement which was accomplished at a later period by the introduction of the turnip; but it was of unquestionable value in hastening the adoption of a better system than that which had heretofore prevailed. The high rent of meadow land during the former and present periods, beyond all proportion to that of arable, is a proof of the advantage which would ensue from the cultivation of clover. Ewes were milked; and Tusser mentions that five ewes were reckoned equal in value to a cow. A sow was also considered of the same value as a cow. These two facts show the inferior state of agriculture; both being occasioned by the difficulty of procuring winter food.

MONTHLY CALENDAR.—MARCH—Third Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock bef. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h. m.		h. m.	h. m.
1 *Su*	61	*Quinquagesima Sun.* St.	6 47	12 34	5 39	26·9	5m58	2a17
2 M	62	[David.	6 45	12 21	5 41	27·9	6 17	3 40
3 Tu	63	*Shrove Tuesday.*	6 43	12 9	5 42	28·9	6 32	5 3
4 W	64	*Ash Wednesday.*	6 41	11 55	5 44	●	6 45	6 26
5 Th	65	Moham. year 1256 beg.	6 38	11 42	5 46	1·3	6 57	7 50
6 F	66	. . .	6 36	11 28	5 48	2·3	7 10	9 16
7 S	67	. . .	6 34	11 13	5 49	3·3	7 24	10 45
8 *Su*	68	1 *Sunday in Lent.*	6 32	10 58	5 51	4·3	7 43	morn.
9 M	69	. . .	6 30	10 43	5 53	5·3	8 9	0 16
10 Tu	70	. . .	6 27	10 27	5 55	☽	8 47	1 43
11 W	71	*Ember Week.*	6 25	10 11	5 56	7·3	9 42	2 58
12 Th	72	. . .	6 23	9 55	5 58	8·3	10 53	3 55
13 F	73	. . .	6 21	9 38	6 0	9·3	0a15	4 35
14 S	74	. . .	6 18	9 21	6 1	10·3	1 40	5 3
15 *Su*	75	2 *Sunday in Lent.*	6 16	9 4	6 3	11·3	3 3	5 22
16 M	76	. . .	6 14	8 46	6 5	12·3	4 23	5 36
17 Tu	77	St. Patrick.	6 11	8 28	6 6	13·3	5 40	5 49
18 W	78	. . .	6 9	8 10	6 8	○	6 55	5 59
19 Th	79	. . .	6 7	7 52	6 10	15·3	8 9	6 11
20 F	80	Spring Quarter begins.	6 5	7 34	6 12	16·3	9 23	6 22
21 S	81	. . .	6 2	7 16	6 13	17·3	10 38	6 35
22 *Su*	82	3 *Sunday in Lent.*	6 0	6 58	6 15	18·3	11 52	6 52
23 M	83	. . .	5 58	6 39	6 17	19·3	morn.	7 15
24 Tu	84	. . .	5 55	6 21	6 18	20·3	1 2	7 47
25 W	85	*LADY D. Ann. B.V.M.*	5 53	6 2	6 20	21·3	2 4	8 30
26 Th	86	. . .	5 51	5 44	6 22	☾	2 53	9 27
27 F	87	. . .	5 49	5 25	6 23	23·3	3 32	10 36
28 S	88	. . .	5 46	5 6	6 25	24·3	4 0	11 52
29 *Su*	89	4 *Sunday in Lent. Mid. Lent Sunday.*	5 44	4 48	6 27	25·3	4 20	1a12
30 M	90	. . .	5 42	4 30	6 28	26·3	4 36	2 34
31 Tu	91	. . .	5 40	4 11	6 30	27·3	4 50	3 57

Meteorological Averages.

Barometer.	Ins.
Mean height	29·843
Highest .	30·770
Lowest .	28·870
Hygrometer.	°
Mean dew-point	39
Highest .	58
Lowest .	19
Mean dryness	4·9
Mean greatest do. of day .	9·6
Greatest dryness	23
Thermometer.	
Mean temperature	43·9
Highest .	66
Lowest .	24
Radiation.	
Mean great. of Sun	16
Greatest power	49
Mean cold of terrest.	5·5
Greatest ditto	10
——	Ins.
Mean qty. of rain	1·440
Mean of evap.	1·488

Table of the Winds.

	Days.	Dew-P.
N. .	2½	31°·5
N.E. .	4	31
E. .	—	—
S.E. .	2	35
S.	2¼	47
S.W. .	9½	44·5
W. .	6¼	42
N.W. .	4½	35

Sunday Lessons.

Mar.		Morning.		
1	Quin. Sun.	Gen. 9	to v. 20.	Lu 12
4	Ash Wed.	Deu. 21	.....	„ 15
8	1 Su. in Lent	Gen. 19	to v. 30.	„ 19
15	2 „	„ 27		Joh 2
22	3 „	„ 39		„ 9
29	4 „	„ 43		„ 16

		Evening.	
Mar. 1	Gen.	12...	Ephes. 6
„ 4	Deut.	22...	Philip. 3
„ 8	Gen.	22...	Colos. 3
„ 15	„	34...	2 Thes. 1
„ 22	„	42...	1 Tim. 6
„ 29	„	45...	Philem.

The Moon's Changes.

New . . . 4th day, 4h. 5m. mn.
First Quart. 10th day, 11h. 8m. aft.
Full . . . 18th day, 4h. 31m. mn.
Last Quart. 26th day, 6h. 42m. mn.

Day of Mth.	Length of Day.	Day's increase	Day break.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	16′ 9″
1	10 52	3 7	4 55	7 32	16 8
6	11 12	3 27	4 43	7 40	16 7
11	11 31	3 46	4 32	7 51	16 5
16	11 51	4 6	4 22	7 59	16 4
21	12 11	4 26	4 7	8 9	16 2
26	12 31	4 46	3 54	8 20	

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OPIUM SMUGGLING IN CHINA.

[Macao.]

MACAO, a town on an island of the same name at the entrance of the river of Canton, is the only settlement which Europeans possess within the dominions of the emperor of China. It was founded by the Portuguese, and still continues in their hands; but since other nations have participated in the commerce of the Indies, Macao has fallen somewhat into decay. In 1725 the Chinese restricted the shipping to twenty-five vessels, and it has since fallen to about one-half this number. For nearly a century the Portuguese monopolised the trade of the East. De Gama, the discoverer of the passage by the Cape of Good Hope, landed on the coast of Malabar in 1498: in 1511 the Portuguese had begun to explore the Indian Archipelago; in 1525 they made themselves masters of Malacca, and soon afterwards achieved the conquest of the Moluccas. Their first attempt to open a trade with the Chinese was not successful; but with a pertinacity and resolution not to be overcome by ordinary obstacles, they persevered in their object, and were finally successful. About the year 1537 the Chinese only allowed them a temporary shelter upon the island of Macao: by bribery and solicitation they next obtained leave to erect sheds for drying goods; and about the middle of the century they began to be recognised as having some title to occupation; but it was only gradually that they were permitted to build stone houses and to form a considerable town. In 1542 the Portuguese had succeeded in establishing a commercial intercourse with Japan, which continued until 1638. Macao was the centre of the trade with China, Japan, and the eastern islands, and the cause of its importance at the above periods is therefore easily traced.

The Chinese are too cautious and jealous a people to concede valuable privileges without reserving the right of reclaiming them. The Portuguese, therefore, are not in possession of the sovereignty of Macao, but pay an annual ground-rent, and their forts are periodically inspected by military mandarins. A civil mandarin also resides in the town as the representative of the emperor of China, and the Chinese population is entirely under his government. The only rights which the Portuguese of Macao really possess are those of a municipal character. Indeed they are occasionally made to feel that neither nominally nor actually are they masters. Milburn states, in his 'Oriental Commerce,' that "the Chinese treat the Portuguese very cavalierly on many occasions, exacting duties sometimes in the port, and punishing individuals for crimes committed against the natives; and whenever resistance is attempted against such proceedings, the mandarin who commands the Chinese at the guard-house immediately stops the supply of provisions from their market until they quietly submit." This means of coercion may very easily be put into execution, for Macao is built on a low sandy promontory, connected with the remainder of the island by a long narrow neck of land; and at a place where the width of the latter is about a hundred yards, a wall has been built, which stretches across and projects at each end into the water. In the centre of the wall there is a gateway, and close to it the guard-house for the Chinese soldiers. This wall was erected in 1573,

and it circumscribes the space to which the Portuguese are confined to a spot about three miles long by one wide. Beyond this boundary they are not often allowed to pass; and this imprisonment is but little more endurable than that to which the inmates of the European factories at Canton are compelled to submit. The Portuguese population of Macao, including slaves, does not exceed 5000, while the Chinese are estimated at 30,000. The town is defended by several strong forts, mounted with heavy cannon, and garrisoned by a small number of Portuguese soldiers, seldom exceeding 250, who are under the command of the Portuguese governor. The Portuguese have a custom-house; and the English and other European nations have factories at Macao. As an outpost of the most singular empire in the world, Macao is at present of more value than as a commercial emporium.

About thirty miles above Macao is the rocky island of Lintin, where ships of war anchor, as the Chinese do not allow them to proceed nearer Canton. The Bocca* Tigris is the entrance of the river of Canton, and is so called from the appearance of one of the islands situated at its mouth. Whampoa, where the merchant-ships anchor, is about fifteen miles north of Lintin, and ten miles below the foreign factories at Canton, with which place the intercourse is carried on by boats. We notice these points because recent circumstances have directed public attention to this quarter; and at the present moment our commercial intercourse with the Chinese is entirely suspended. The reader will perhaps feel interested in a brief statement of the facts out of which this state of things has arisen.

Within the last forty or fifty years the consumption of Indian opium in China has risen from 1000 to 27,000 chests,† and this drug has formed an article of export from India to China exceeding in value all the tea which China has supplied for our own consumption and for exportation to our colonies and to foreign countries. This important trade has unhappily been long carried on in defiance of the regulations of the Chinese authorities, opium having been made contraband about the close of the last century. The trade was at that time chiefly carried on at Macao; but in 1802 the English merchants removed it to the island of Lintin, which has since been the great opium depôt. Here it is kept stored in armed ships, and is delivered to the Chinese by written orders from Canton. The nature of the transaction is thus described by a Chinese writer:—"At Canton," he says, "there are brokers of the drug, who are called melters. These pay the price of the drug into the hands of the resident foreigners, who give them orders for the delivery of the opium from the receiving-ships. There are carrying-boats plying up and down the river, and these are vulgarly called 'fast crabs' and 'scrambling dragons.' They are well armed, and are manned with some scores of desperadoes, who ply their oars as if they were wings to fly with. All the custom-houses and military forts which they pass are largely bribed. If they happen to encounter one of the armed cruising-boats, they are so audacious as to resist, and slaughter and carnage ensue."

The taste for opium which prevails in China, combined with the unparalleled corruption of the authorities, has rendered the execution of prohibitory regulations totally impossible. All classes join in forgetting their existence. Four or five years ago, one of the Chinese censors addressed a memorial to the emperor, in which he stated that "magistrates of districts issue proclamations interdicting the clandestine sale of opium, at the same time that their kindred and clerks and servants smoke it as before. The police, influenced by the people in the public offices, become the secret purchasers of opium, instead of labouring for its suppression; and thus all interdicts and regulations become vain." This is perfectly true; and a contraband trade of the annual value of above 3,000,000*l.* sterling having grown up in spite of frequent edicts for its suppression, is another proof of the difficulty of enforcing regulations which are strongly at variance with the tastes and desires of a large portion of any community.

The practice of opium-smoking appears to have descended from the richer to the poorer classes, and to have extended with astonishing rapidity. In 1833 the emperor made a renewed attempt to repress or destroy the habit; and in the edict issued for this purpose it is said—"Let the buyers and smokers of opium be punished with one hundred blows, and pilloried for two months. Then let them declare the seller's name; and in default of this declaration, let the smoker be punished, as an accomplice of the seller, with a hundred blows and three years' imprisonment. Let mandarins and their dependants who buy and smoke opium be punished one degree more severely than others; and let governors and lieutenant-governors of provinces, as well as the magistrates of subordinate districts, be required to give security that there are no opium-smokers in their respective districts." In 1836 an officer of the Chinese government proposed that opium should be admitted on payment of a duty; but this intelligent proposition does not appear to have been favourably received, and the smuggling went on as before, all classes joining in conniving at the illicit traffic.

In March, 1839, the Chinese government appear to have taken more decided steps than any which had yet been adopted to prevent the introduction of opium, and under the direction of an imperial commissioner from Pekin, the British residents were shut up in their factory, and only obtained their release on condition of giving up the stock of opium on board the ships, amounting to 20,283 chests, worth nearly 3,000,000*l.* sterling, the Superintendent of British Trade giving the owners indemnity scrips. The contents of every chest were subsequently emptied into sluices communicating with the river, in the presence of the Chinese authorities, and many of the residents of the British and other factories who were invited to attend. Men were employed from day to day in hastening the process of maceration until the opium had become muddy and fetid, when the whole of it was washed into the river. After this the merchants withdrew to Macao, whence they were expelled by the Chinese on the 27th of August, in consequence of refusing to give up a seaman who had killed a Chinese in a brawl. They then retired to their ships at Hong-Kong; but the fleet being in want of provisions, the Superintendent of British Trade, on the 4th of September, endeavoured to obtain a supply from the natives, but was opposed by the Chinese war-junks; and in the conflict which ensued, several Chinese were killed and some Europeans wounded. A fresh attack upon the Chinese, which was to have been made the following day, was countermanded. On the 11th of September the Superintendent notified a blockade of Canton river and port; but on the 16th the blockade was abandoned, in consequence, it is said, of negotiations having been commenced with the Chinese. Proceedings of a still more serious nature have taken place subsequently; and these events have greatly complicated the state of our relations with China. In the speech from the throne, on the opening of parliament, on the 16th of January last, the interruption of our commercial intercourse with that country was formally announced; and a naval force has just been despatched for the purpose of aiding, by a warlike demonstration, the negotiations which may be required to settle these serious difficulties. In the meantime the sales of opium are advertised at Calcutta as usual; and the general opinion is that it will be found impossible to

* Bocca, the Italian word for 'mouth,' is used, either in the singular, or in the plural, 'bocche,' to designate the mouths of rivers or the narrow straits leading into a bay. The Spaniards spell the word 'Boco,' and the Portuguese 'Bocca.'

† Each chest weighs 150 lbs.

prevent the introduction of the article into China by any plan however rigorous; for the individuals who should put the prohibitory law in execution, conspire to evade it; and, generally speaking, are so low in moral character, as to prefer their interest to their duty.

In England opium is almost entirely employed as a medicine. In Lincolnshire it is said to be taken for its intoxicating properties, the practice having originated in its use as a remedy for the ague. The assertion that opium is taken with the same object in the manufacturing districts of Lancashire cannot be traced to any authentic source, and we do not believe that the abuse of the drug is prevalent in those parts. Neither opium nor any of the preparations in which it is a chief ingredient ought to be used except under the direction of medical men. It appears from a Return made to the House of Commons in 1839, that out of 543 persons in England and Wales who died from the effects of poison in 1837 and 1838, and on whom inquests were held, the fatality was occasioned in 186 cases by opium or its preparations; and nearly one-seventh of the whole number of cases (72) were young children, most of them under one year, to 52 of whom an overdose of opium, or laudanum, or some cordial in which opium is used, had been given; and in 20 other cases the children had been poisoned by taking such medicines in mistake. In this Return the coroner of Nottingham stated that at a druggist's shop in that town, in which the attendants were two girls, one of them was in the habit of selling twice as much laudanum for a penny as the other. The use of cordials and made-up quack medicines for children is not only pernicious, but highly dangerous; and none but the careless, the indolent, or the ignorant resort to them.

THE DRUID STONES NEAR SHAP, IN WESTMORELAND:

WITH AN ACCOUNT OF SHAP SPA.

[From a Correspondent.]

Shap, anciently written Hep or Heppe, is a long straggling village on the great road (sometimes called the *west* north-road) leading from Liverpool and Manchester to Carlisle, and thence to Edinburgh or Glasgow. It is sixteen miles north of Kendal, and thirty south of Carlisle. Shap Fells, a mountainous district lying between this village and the town of Kendal, is considered one of the most bleak and dreary regions that is traversed by the principal roads in the kingdom. It is generally believed that the change of name from Hep or Heppe to Shap has originated with the inhabitants pronouncing the fruit of the briar and the dog-rose, the hip or hep—*choup*: hence the easy transition to Shap, the present name of the village. Judging from present appearances, however, some objection might be started against this mode of arriving at its present name, since the surrounding country is remarkably bare and destitute of all sorts of wood; but on referring to ancient records connected with lands in this vicinity, we find that some centuries ago much of the surrounding country consisted of woods and forests, of which, however, at the present day, not the slightest vestige remains, except on a lofty eminence about two miles south by east of this village, known as Shap Thorn, where there is a small clump of aged hawthorns, evidently at one period surrounded by a wall, and planted there as a landmark when the roads through these desolate regions were mere tracks and but little frequented.

It is now nearly thirty years ago since one of the few remaining temples or monuments of the ancient Druids ceased to exist, save in the chronicled pages of a few local and antiquarian writers, and in the memories of the present generation of inhabitants of the surrounding district, and of those strangers that business or curiosity may have attracted to those parts; for when the waste or common lands were enclosed by act of parliament about the time above stated, most of the stones of which this remarkable monumental curiosity was composed were blown into fragments by the power of gunpowder, and employed by the inhabitants in erecting rude stone fences. So that the stranger who reads the history of Westmoreland, or any other that treats of this Druidical monument, and is thereby induced to visit the scene, would experience nothing but disappointment when some rude hind pointed out to him where "the girt (large) staynes yance stuyd."

This monument was situated a little to the south of the village, and consisted of two irregular rows of huge unshapely stones, though differing very materially in size, for the largest were ten or eleven feet high, and of nearly the same thickness, while the smaller ones were not half these dimensions. The two rows were not quite parallel, the distance apart varying from twenty to something over thirty yards; while the distance between the stones for the most part was ten or twelve yards; the entire length of the rows being a little more than half a mile. The present turnpike road passed at a short distance on the west side of these rows of stones. At the upper end of this remarkable parallelogram there was a rude circle of middling-sized stones, in all probability the place of sacrifice used by those ancient priests the Druids. The quality of these stones is a species of granite, reddish, and full of large white shining specks of spar-like appearance. When polished, some of them are veined, and have an ornamental appearance. There is no regularity in their shape, and few of them present sharp angles; indeed for the most part they seem from their rounded forms to have been long subjected to the action of water. This species of stone is called by the country-people thunder-stone, but upon what authority seems a matter of much doubt. I have heard the inhabitants assign *two* reasons—one, that the stones have fallen from the clouds during thunder-storms; and the other, in consequence of their giving out sparks of fire when struck against each other, at the same time emitting a faint smell of sulphur. But in fact the great majority of the people would not be able to assign any reason for so singular a name, not troubling themselves to inquire into the origin of names.

This species of stone is very scarce in that part of the country; indeed, where these stones are found at all, they are mostly found singly, and at great distances from each other; and from an intimate acquaintance with the whole neighbourhood, I feel quite sure that the Druid stones could not be replaced from a surrounding district of very considerable extent. From whence they were brought to the situations they so long occupied, I have never even heard conjectured; that no human means were used to place them in their relative positions would be an opinion too wild to be hazarded. Then there arises a question of the means employed to convey such ponderous masses as many of them were; for even in our own enlightened generation, how should we manage to convey blocks of stone weighing one hundred tons to any great distance through a rough and broken country?

Probably at the time these stones were first placed here their order may have presented a greater degree of regularity and uniformity than was the case during the past generation or two, for it is a well-ascertained fact that mill-stones were formerly cut out of some of the Druid stones, and in this way it is not improbable that several of them might have been moved from their original positions, while others might have totally disappeared.

Somewhere about eighty years ago a spa, or mineral spring, was discovered three miles south by east of the village of Shap, which has of late years become a place of considerable resort. This small spring issues from the upper part of a rocky bank near a mountain-stream, which, about four miles below, empties itself into the river

Lune. The water of this spring is strongly impregnated with sulphur, besides containing other medicinal properties, and has been found highly beneficial in certain disorders, particularly those of a scorbutic nature. Notwithstanding the surrounding district is an almost unbroken bleak and dreary moorland, two or three small enclosures immediately adjoining the spring, and on which there is a small farm-house, form a slight contrast to the extensive heath-clad region. For a considerable period Shap-well water, as it was called, was only tried internally, that is, it was drank by such persons as deemed it worth their while to visit the spring at its well-head, some of whom would carry a portion of it off in large stone bottles to their distant homes. There was no charge —no interdiction; *then* this water had not been made a source of profit either to the owner of the property or the tenant that rented the small farm. A licence to sell ale at length was procured, so that the visitors to Shap Wells might be accommodated with bread and cheese, and a little indifferent ale to wash it down. This was considered a vast improvement upon the whole system; for where the visitors had a long way to trudge to their homes, it obviated the necessity of carrying victuals along with them. By-and-bye a spare bed occasionally might be had at the small farm-house, but not a spare room, there being no partition across the unceiled and naked chamber. In process of time a wonderful accession was made; a peat-shed, as it was unostentatiously styled, was erected near the spring (about one-third of a mile from the small farm-house), in one corner of which was placed an old rum-puncheon, as a substitute for a more regularly shaped bath; and in the opposite corner was fixed a small boiler, the fuel, which consisted of turf or peat, being piled up between them, but leaving space enough to move from one end of the shed to the other, the dimensions of which were probably not over twelve feet square. This was considered a wonderful achievement, for Shap Wells had now actually become a bathing-place. The bath, however, was not a very convenient one; for the hogshead had to be mounted through the assistance of a short ladder with narrow rounds—not very agreeable to bare feet, and descended into in a similar manner. Then there was no attempt at a private dressing-room, the peat-shed being, in fact, the place of general accommodation. After a person had just emerged from the warm region of the steaming puncheon, it was no very agreeable thing, particularly in cold weather, to have to dress in the filthy peat-shed and walk one-third of a mile afterwards before being able to get near a fire; and then, most probably, but an indifferent one in a cold stone kitchen. I well remember the old rum-puncheon, for in my younger days I occasionally patronised it, as, although against my own inclination, I was recommended this use of the water.

By-and-bye a new building was erected as a place of accommodation for those who wished to spend some time at Shap Wells for the benefit of the waters. But a slight mistake, or rather oversight, took place regarding this recent improvement, for those interested in it erected the new building close alongside the old farm-house, instead of in the immediate vicinity of the spring. This mistake was discovered before the building was completed; and the undertaking was left unfinished. A sleeping apartment or two were, however, fitted up in the new house, so that two or three individuals occasionally might be found (invalids for the most part) staying at this retired and out-of-the-way watering-place.

Matters continued in this state for some years, and many complaints got abroad respecting the want of accommodation, while the benefits derived from these waters were said to be many, and some of them truly wonderful. The subject at length roused the attention of the owner of the property, the Earl of Lonsdale; and about ten years ago a large and commodious hotel was built near the spring, with bath-house, stables, coach-house, and every other appendage necessary for such an establishment. Some of the barren knolls were planted with suitable shrubs and timber; gardens were made where the soil was found to be best suited for the purpose; and two carriage-roads were opened—one communicating with the great road leading over Shap Fells, and the other with the turnpike leading from Shap to Orton. These great improvements effected all that had been predicted, that of annually attracting a large and respectable concourse of persons, some in the expectation of deriving benefit to their bodily infirmities from the healing effects of this long neglected spring; others, to breathe the pure mountain air; and others, in the hope of meeting with good and agreeable society, of which, for the last few years, during the summer-months at least, there has been no scarcity at this rural and secluded, but now fashionable resort of the Spa Hotel, *alias* Shap Wells.

The only object in the neighbourhood of this watering-place (now that the Druid Stones no longer exist) commonly visited by strangers, is the ancient monastery, generally known as Shap Abbey. It is situated in a lonely vale, one mile west of the village of Shap, and about four miles from the new hotel at the Wells. This valley is watered by the river Lowther, which, in the vicinity of the abbey, is little more than a mere mountain brook. Although the size of the original church, as well as several other parts of the ancient monastery, may still be distinctly traced, the tower of the church is nearly all that remains of this ancient monastic establishment. It was founded in the early part of the twelfth century; and although the surrounding country at the present day is, as has been already stated, so bare and destitute of timber, for several centuries subsequent to that period much of the adjoining lands were covered with timber, or were at least in the customary forest state.

Friendship and Patriotism.—A man who loves only himself, without regard to friendship and desert, merits the severest blame; and a man who is only susceptible of friendship, without public spirit, or a regard to the community, is deficient in the most material part of virtue.—*Hume's Essays.*

Superstition and Enthusiasm.—Weakness, fear, melancholy, together with ignorance, are the true sources of superstition. Hope, pride, presumption, a warm imagination, together with ignorance, are the true sources of enthusiasm.—*Hume's Essays.*

Law and Knowledge.—From law arises security; from security, curiosity; and from curiosity, knowledge. The latter steps of this progress may be more accidental, but the former are altogether necessary.—*Hume's Essays.*

Fondness of Men for their Occupations.—The German miner, who leads the most toilsome life, and is more scantily rewarded than any other labourer, speaks with a kind of enthusiasm of his pursuit. He loves it because it is totally different from anything else. The life of a German waggoner should certainly be considered a stupid and dreary one. To walk slowly, step by step, by the side of a team, day after day, on the same route, on which he knows every innkeeper's face, and every rise and descent of the road, cannot be believed to have many attractions. Yet he speaks with delight of his trade. In one of my pedestrian journeys I met with a train of heavily laden waggons proceeding to Leipzig shortly before the fair. I entered into a conversation with the eldest of the waggoners, who, in informing me of his course of life, told me of the several diseases to which he was subject, and mentioned that he had remained at home for some time in consequence of sickness. As these men are generally wealthy, I evinced my astonishment that he again exposed himself to the inclemency of the weather, as his state of health seemed to warrant no such exposure. "Ah," said the old man, jogging along on his crooked legs, "a waggoner cannot remain at home—we love our profession."—*Dr. Francis Lieber.*

COTTAGES.—THATCHING.

Cottages are a class of objects from which a traveller passing hastily through a country may perhaps most safely draw conclusions concerning its internal condition. They also indicate something of the geological character of each district, and are in some degree modified in their forms by the influences of climate and situation; and further, they may also illustrate the history of the country, and show what is the standard of comfort in reference to one of the three principal physical wants of man. We do not of course mean to attach very great value to opinions formed on an outside view of things, but sufficient may be gathered to correct or corroborate information derived from sources assumed to be more authentic; and, taking the widest points of observation, the views suggested by an Irish cabin and a neat English cottage would probably need little further correction after a careful inquiry into the means, resources, and internal economy of their respective inmates.

In England, cottages are built of the material which the immediate neighbourhood supplies. Thus, on the downs of Kent and Sussex, flint, which forms a cheap and excellent building material, is commonly used; and wherever the walls are formed of mud or some equally common mixture, we may infer that better materials are not to be found within a considerable distance. The same inference would not be correct if applied to Ireland, but would require to be modified by a knowledge of the comparative wealth of each country. In Staffordshire the cottages are covered with tiles of a dark blue colour, resembling cast-iron in appearance, and almost as hard; in the north of Derbyshire a grey and white slate is much used; in the red-sandstone districts the tiles are of a glaring red; in some of the clay-districts they have a whitish appearance, in others a yellowish hue; in Westmoreland the old cottages are covered with large thick unhewn slates.

In a cold climate the roofs of cottages are usually made steep, in order that they may be less liable to injury from heavy falls of snow, and to allow the rain to shoot off the surface as quickly as possible. In Derbyshire the roofs are more acute than in the southern counties. The old English cottage of clay, mud, or turf required a similar roof to lessen the pressure on the weak walls. In the north-eastern parts of Europe the country at a passing view seems to be much more advanced and prosperous than it really is; but the long and severe winters will account for the extensive accommodation provided not only for men but cattle. The roofs of the cottages in Russia are high pitched, and covered with sawed boards projecting six feet from the walls; the interstices are filled with moss; and every plan is adopted which tends to maintain a high degree of heat within. In Norway the roofs have a pitch of about two feet, and are closely boarded on the outside, and coated with birch-bark peeled off in large flakes. Earth is then laid on to the depth of about three inches, being retained by a ledge along the bottom of the roof; and the surface is rendered compact by a crop of grass or moss growing on the earth. The general appearance of a Swiss cottage is well known. The roof is formed of short pieces of pine split into thin layers, and held together by small spars laid across them; and stones are laid on the top, to protect the roof against winds and storms. The north of Europe, where there are immense forests, is the original country of the American log-hut. The Canadian 'shanty' is the log-hut in its simpliest form, but the roof is better adapted for carrying off the wet than those formed of bark or boards. It is formed of split logs hollowed, and laid alternately with their convex and concave side uppermost. In very dry countries, as Egypt and Persia, the houses have flat roofs, the walls being carried above them and forming a parapet. The house-top is a place for social conversation, for walking upon, and for sleep under the canopy of heaven. When we find the flat roof adopted in the northern parts of Persia, where occasionally heavy falls of snow and rain occur, we have an instance of the influence of fashion over circumstances; and much attention is required in wet weather to the state of the roof, for it is not adapted to the climate.

Cottages may either be clustered in villages or scattered over the face of the country. In Hungary the rural population is all found in villages. This has been a land where war and rapine have often prevailed—the 'border' of the East and West—the bulwark against the torrent of population from the East which threatened at one time to overwhelm Europe—and men have been impelled towards each other by the want of mutual protection. In France and Germany the country-people also live in villages and hamlets, and these countries, consisting for the most part, like Hungary, of extensive plains, have often been the battle-field of contending powers; while the feudal system and its influence long prevailed and affected the forms of society. In England, on the contrary, which has been for eight centuries exempt from foreign devastation, and where the shackles of the middle ages easily gave way as industry and commerce increased, the motives which cause an agricultural population to live in little communities have not been either so powerful or so generally felt. The cottages of England are scattered over her hills, valleys, and plains, by the side of heaths and commons, on the verge of woods, and in the pleasant nooks of green lanes. Let a poet describe the situation of the cottages of Westmoreland:—

> "Clustered like stars some few, but single most,
> And lurking dimly in their shy retreats,
> Or glancing at each other cheerful looks."

In Ireland, where there is an incessant struggle for land as a means of subsistence, and the proportion of landowners to the whole population is lower than in any country in Europe, landlords sometimes place a cottier on the verge of a barren moor at a high rent, and when the tenant has reclaimed a portion of the land, and is about to reap the reward of his industry, he is moved farther on the unreclaimed waste, still at a high rent, and the landlord profits by his previous painful exertions. On some estates in the same country, where improvements have been made, the small collection of cabins in which the occupiers resided have been broken up, and cottages have been built on the respective holdings of the tenants. When landlords are less liberal, the cottier is often placed on the worst part of the land, and a higher rent is charged than for the best land. Very generally the cabins are erected by the road-side, where the least damage can be done by pigs and poultry. The labourer in fact prefers this situation, as his pig can pick up some of its food along the road, and the farmer is less liable to injury from trespassing. The vicinity of a bog is generally thickly inhabited, on account of the facilities of obtaining fuel.

If we take the cottages of a country as indicative of the standard of comfort, much may be ascertained, even at a cursory glance, to excite at least reflection and inquiry. The best-lodged people in Europe, according to Mr. Laing, are the Norwegians; the dwelling-houses of the humblest labourers in Norway being divided into several apartments, which have wooden floors and a sufficient number of good windows. Norway is the country of small landowners, and the possession of property exercises an influence which tends to elevate the standard of comfort; and having long enjoyed free political institutions, the standard of morals is high also. In Ireland, the country of small *tenancies*, the standard of comfort is exceedingly low. The cottages of the poorest class of Irish peasantry are neither so neat nor so warm and comfortable as the huts of the New Zealanders or many other people

whom we term savages. Were it not for the influences of Christianity upon their moral character, the Irish people

[New Zealand Village.]

would long ere this have sunk into hopeless barbarism; and in this, and not in their physical condition, consists their superiority over the New Zealanders. The external appearance of the cabins of Ireland tells us plainly of a people oppressed and neglected, and we scarcely need ask if comfort prevail within. It is, however, a good thing to be told of the evils which call for a remedy partly at our hands, and we will therefore briefly describe the interior of an Irish cabin.

The habitation which an Irishman considers sufficient for his accommodation often does not admit of light except by the door. In some cabins there are two doorways opposite each other, the one to leeward being left open, and the windward door being shut. This door is nothing better than a piece of matted straw. The thatch inside is blackened with smoke and cobwebs, and, through the effects of age and damp, the roof has become rotten; the floor, consisting of the natural earth, is sunk into hollows, in which the water dropping from the roof is collected, and, being lower than the outside surface, it is damp and moist, even if the thatch be impervious to the rain. The furniture consists of a few stools and a table formed of old boards and old sticks; or perhaps there is no such article as a table, but stools and a few pots complete the inventory; and in many a cabin a pail with the bottom upwards is the only table. Some straw and one or two old and ragged blankets serve for bedding; but the straw is often burnt to boil the potatoes, in consequence of the scarcity of fuel.

[Irish Stone Cabin.]

Even in Irish cabins there are gradations, and a depth of wretchedness descending lower than the ordinary degree of misery. Some cabins, just visible above the surface, are mere gravel-pits or wide ditches, the sides of which form the lateral walls, the ends being blocked up with sods, earth, or mud; and the roof is formed of sods covered with potato-stalks or furze-bushes. It not unfrequently happens that the inmates of such dwellings have thrown down their former wretched cabin, intending to build another, but have miscalculated their means. In the vicinity of some of the bogs there are cabins built entirely of turf. 'Bog-sticks' are made fast at the angles with ropes of sedge, and these frail rafters are covered with sods of turf, leaving a hole in the roof for the smoke to escape. These places have neither doors nor window-frames, but when the turf on the roof becomes dry, the air is admitted in the chinks caused by its shrinking. The roof is scarcely ever thatched, as the trouble and expense would be ill laid out on a wretched tenement which is not a whit better than a bird-tenter in the fields erects for his amusement. Such a habitation may be put up in half a day; and those of a better class may be erected at a cost of from 2*l.* 10*s.* to 5*l.* We give an estimate of the cost of a cabin in the county of Waterford:—Timber for roof, 12*s.*; a ton of straw, 25*s.*; carriage of stones, three feet high by fourteen feet wide, 5*s.*; carriage of timber, 2*s.* 6*d.*; carpenter, putting up roof, 2*s.* 6*d.*; door, &c., and making, 5*s.*; building cabin walls, 10*s.*; thatcher, four days, 4*s.*: total 3*l.* 6*s.* It will be seen that two-thirds of the expense are incurred in raising and covering the roof; and as Ireland is more subject to rain than any country in Europe, it may be conceived how important this part of the edifice is, and how much the comfort of the inmates depends upon its being kept in good preservation. A few extracts from the notes of the Commissioners of Irish Poor-Law Inquiry will show the means of protection which an Irish cabin affords from excessive moisture.

[Irish Mud Cabin.]

In the county of Galway, it is stated, the cottages and cabins are thatched with oat and wheat straw, as a preparation for which the rafters are in the first instance covered with a layer of thin sods, which forms a groundwork for the thatch. Amongst the most necessitous poor, who cannot afford to renew this roof, it becomes quite pervious to the rain, which is scarcely kept out by repairs made with potato-stalks and thistles. The cabins of the county Mayo are of an equally wretched description, built of loose stones, with a thatching of straw or potato-stalks, which is kept down with ropes or large flag-stones, to prevent the whole being blown away by the westerly winds. Straw for the roof costs about 10*s.*, and a man thatches it in two days, charging a shilling a day for his labour. The cost of erecting a cabin is from 2*l.* 15*s.* to 3*l.* In the cabins in the county Sligo, the roof is frequently formed of branches of trees laid across the rafters and covered with 'scraws,' that is, sods of turf, over which is laid a very thin and imperfect thatching of straw. In the county Kilkenny the rafters are laid on the summit of the walls without the interposition of eaves-stones; and from the constant soakage through the

roof, the interior of the walls is continually in a damp and dripping state, and the walls themselves moulder away rapidly and accelerate the decay of the thatch. These roofs afford such insufficient protection from the wet, that the inmates are often obliged to shift their beds to another corner of the cabin in the course of a night to avoid the rain; and at one of the examinations, in the course of the inquiry, a witness stated that, when taking shelter in cabins, he had found little more protection from the wet than if he had remained out of doors; and another witness, alluding to the rottenness of the thatch, said that it was little better than living under a dung-hill. The rain falling upon the floor, which consists of the natural earth, contributes not a little to the dirt and wretchedness of the inmates. On a cabin being erected, the floor is made by digging up the ground on which the house is built, and then trampling it into solidity. At an examination under the inquiry, Captain Atkinson said to one of the peasantry, "When this is to be done, they sometimes have a dance for that purpose, have n't they, Barney?" "Yes, Sir, and many a match comes out of a thing of the sort." Thus recklessly does the Irish peasant marry, and the misery which is his lot descends to his children. His ideas of a suitable dwelling rise no higher than a hovel of raw earth and sticks, which may be obtained with scarcely any foresight, and erected in a day or two. In nearly every county in Ireland the peasantry can erect their own cabins. The cottage of an English labourer costs 50*l.* or 60*l.*, and frequently more; and if a cottager build for himself, which few do, the cost will be 20*l.* or 30*l.* The rent of the most ordinary cabin in Ireland is 15*s.* or 20*s.*; and if half a rood of land be attached, the rent rises to 2*l.* In England the rent of a comfortable cottage is probably about one-eighth of the labourer's income; but the Irish peasant expends about a fourth of his income in the rent of his miserable abode and small patch of land.

There is only one portion of Great Britain where the habitations of the people are of so wretched a description as in Ireland. This is in Lewis, one of the Western Islands, where, according to the 'Statistical Account of Scotland,' the houses are without a pane of glass; and cattle, as well as human beings, are under the same roof. Wood is so scarce, that, with their rude and unimproved industry, they cannot afford to put good rafters on their cottages. "The roofs have no eaves. The thatch in general is made of stubble or potato-stalks, which are spread on the scanty wooden roof, and bound by leather or rope straws, which again are at each side of the roof fastened by stones called anchors, resting on the top of the broad wall. From the slightness of the wooden rafters, much straw or stubble cannot be laid for thatch, but just sufficient to exclude the daylight. The thatch is not expected at first to keep out the rain until it is impregnated with soot; but the inmates keep plenty of peats on the fire; the interior is soon filled with smoke; the smoke and increasing heat repel the rain, for a great proportion of what falls on the roof is returned to the atmosphere by evaporation. These houses, after a smart shower, appear like so many salt-pans or brewhouses in operation." The interior is in a corresponding state of wretchedness; and we learn, with scarcely any surprise, that plats of dried turf occasionally serve for blankets. It ought to be a matter of congratulation that in Great Britain at least it is only in a few remote places that we can find parallel instances of so barbarous a domestic condition.

Much, however, remains everywhere to be done in the way of improving the domestic habits of the humbler classes; and it is not amongst them alone that low notions exist of the comforts to which they should aspire, but some blame attaches to the builders of cottages. Cottages of superior appearance do frequently present themselves, but often they are rather intended to be ornamental objects; and the internal arrangements show that little attention has been paid to comfort, health, and propriety. Happily there are numerous instances in which the latter objects have also been kept in view, and we hope this feeling is increasing. It is, however, but a few years since that excellent institution the Highland Society, which is an honour to Scotland, offered a premium for the best designs for labourers' cottages; and of the great numbers sent in, not one showed a floor above the level of the ground they were to be built upon.

[To be continued.]

HORSE ARMOURY IN THE TOWER.

III. Henry VI.

[Continued from No. 506.]

Although, unfortunately, the Tower does not possess any complete specimens of armour of the period between the reigns of Edward I. and Henry VI., it will be necessary, in order to make our account of military costume complete, to describe the improvements which took place in those reigns. The specimens of armour extant of the thirteenth and fourteenth centuries are extremely rare, and the principal authorities for the costume of those times are the allusions made by contemporary historians and poets, and the illuminations in the MSS. of the period. To these we may add the occasional assistance of a monumental effigy, and the notices to be found in the early rolls and wardrobe accounts of royal and noble families. It is from such authorities that Sir Samuel Rush Meyrick and other collectors of arms and armour are enabled to identify the æra of the specimens which may fall in their way; and from the writings of such collectors we compile our present account.

We have already said that in the reign of Edward I. an approach to plate armour had been made in the adoption of elbow and knee pieces, and from this time armour of plate began rapidly to supersede the old costume. The figure of Edward I. in the Tower (engraved at page 25) does not however present us with more than the ordinary armour of the knights, which was still mostly of the fashion of the preceding reigns.

Among the most important additions to armour in the reign of Edward II. were the *mamelières*, or breast-pieces, two round plates of steel fastened on the breast over the surcoat, chains being attached to them, from one of which depended the sword, and from the other the helmet, the latter never being worn except at tournaments or at the time of action, when it was placed over the bascinet, a close-fitting iron cap in the shape of a basin.

In the chancel of Ash Church, in Kent, is the monumental effigy of a knight clothed in armour of the latter part of this reign, which exhibits the latest improvements. The general appearance of the warlike costume of the period may also be seen in the seal of Edward, prince of Wales, afterwards Edward III.; in this he is represented with ailettes on his shoulders, on which his heraldic bearings are depicted. Ailettes, however, became very uncommon towards the close of the reign of Edward II., and disappeared altogether in the middle of the fourteenth century.

The next additions in the way of plate armour which we have to notice were made in this reign, and consisted of brassarts and vanbraces (avant-bras) on the arms, and greaves in the front of the legs. The hauberk at this time, instead of having a hood of mail attached to it, now terminated at the collar; a neck-guard of chain, called the *camail*, being fastened to the edge of the bascinet, and falling down upon the shoulders over the surcoat, leaving a small opening for the face.

We next enter upon the chivalrous times of Edward III., and it is now that we observe the greatest additions of plate to the armour. The legs and arms were entirely defended by plate, gussets of mail being only worn under the arm and at the bend of it. The feet were guarded

by pointed shoes of overlapping steel-plates called *sollerets*. The leathern gauntlets were similarly cased with steel and provided with steel tops, besides which small spikes, knobs, or other ornaments were placed on the knuckles, being called gads or gadlings. The gauntlets of Edward the Black Prince are of brass or latten, and the gadlings are made in the shape of lions or leopards. These are preserved over his tomb in Canterbury Cathedral.

The emblazoned surcoat, so conspicuous in the costume of the thirteenth century, was gradually discarded in the fourteenth for a more convenient garment called a jupon, or guipon, made of velvet, and richly embroidered with the arms of the wearer. It fitted the body tightly, and was confined on the hips by a magnificent belt, to which on the right side was attached a dagger, and on the left a sword. This belt forms a distinguishing feature in the dress of a knight until the close of the fifteenth century, at which time it can only be recognised in the lowest border of the body armour, it having gradually descended from the hips almost to the knees. About the year 1367, traces, or overlapping plates of steel below the breast-plate, were introduced, the monument of Humphry de Bohun, earl of Hereford, who died in that year, being represented with them; but it was not until the reign of Henry V. that they became general.

It was about the middle of the reign of Edward III. that visors were attached to the bascinets, and when this was the case, the helmet was dispensed with altogether.

Back and breast plates of steel were also worn, so that the hauberk and plastron, both exceedingly heavy, were dispensed with, much to the relief of the warrior. Indeed it was one of the principal recommendations of plate armour, that it was so much lighter than the cumbrous chain-mail and its accompanying garments, the oppressiveness of which was so great that the knights sometimes sank under it, suffocated with the heat as well as oppressed with the burden.

The monument of Sir Oliver Ingham, at Ingham Church, Norfolk, of the date of 1343, exhibits most of the peculiarities of the armour of this period; and it is also valuable as representing the earliest specimen of the large justing helmet surmounted by the crest of the Ingham family, an owl with wings expanded.

The military costume of the time of Richard II. was increased in splendour, partaking of the sumptuous extravagance of the age, which, as regards apparel, has never perhaps been exceeded in England. Chain-mail was entirely disused, complete suits of plate being adopted, often totally covered with ornaments of fine workmanship, the richest suits being imported from Italy, where the manufacture of armour was carried to the highest perfection. The most curious novelty of this reign is the visor, which, instead of being adapted to the contour of the bascinet, became of a peaked shape, projecting from the face like the beak of a bird. Only two of the visored bascinets of this period are known to exist, one in the Meyrick collection, the other in the Tower of London. The latter was added to the National Collection in the year 1834. The shields, which hitherto had been generally triangular, or nearly so, now considerably altered. They were rounded at the bottom, and a niche or escallop was made on one side of the top, called a *bouche*, or mouth, serving as a rest for the lance.

The costume of this reign was continued with very little variation in the reigns of Henry IV. and Henry V., but the *solleret*, or steel shoe, was frequently supplied by footed stirrups incasing the feet, superseding the necessity for any other defence for the feet, and allowing the *jambes*, or leg-pieces, to terminate at the ankle. In the reign of the latter king, the bascinet became rounded behind to the shape of the head; and on the top a tube or hollow knob was placed to contain the *panache*, the feather or feathers, now for the first time worn on the head of a soldier, though they had for a considerable time been worn in the hat by courtiers and civilians. Feathers worn at the side of the bascinet were termed *plumes*. A great peculiarity of this period is the use of large hanging sleeves of cloth with or over the armour. These are frequently seen in illuminations of the age, but when they are not worn, the shoulders appear covered with overlapping plates called *pauldrons;* and two circular plates called *pallettes* are sometimes fastened to them in front, so as to protect the armpit. Lance-rests in the form of hooks placed just below the breast, and breast-plates of two pieces, the lower one rising to a point in the centre and fastened to the other by an ornamented buckle, are also characteristic of this reign. The lower plate was called the placard.

The surcoat, or jupon, is frequently alluded to by writers of the thirteenth century as the *cote d'armes*.

The principal addition to the weapons of this century was the pole-axe, an instrument almost always used by commanders. Two-handed swords with flaming and waved blades are also to be met with in illuminations, but it is most probable they were principally used for state.

The armour of Henry V. is represented on his great seal, as well as in one of the illuminations of the celebrated Bedford Missal.

The character of the armour in the reign of Henry VI. may be seen in that worn by the figure in the Tower (engraved in page 68). This, it will be perceived, is without the surcoat or jupon, so distinguishing a feature in the military costume of the Edwards and Henries previous to this period; but it was almost entirely discarded in this reign, and is therefore but seldom to be met with. In this figure of the king, the breast and back plates are composed of several pieces, to render them flexible, and the hips are protected by the *tuilles* or *tuilettes*, plates depending from the traces, or skirt of the armour in front, over an apron of chain-mail. On his head he wears the knight's cap, surmounted by the royal crest. The cap here represented was frequently worn over the *salade* or *sallet*, a German head-piece first imported in this reign, the principal characteristic of which is the projecting behind. It had sometimes only a horizontal slit for the sight as it descended below the eyes, but at others it came no lower than the forehead, and was furnished with a moveable visor. The long-toed *sollerets* and formidable spurs, the latter being screwed on to the heel instead of being fastened by straps, are remarkable features of the costume of this time.

The caparisons of the horse on which the figure of Henry VI. is mounted, are emblazoned with the arms of England and France; the head of the animal being protected by the chanfron.

Modern Colonists.—In the middle ages, the intercourse not only between nations but also between petty states and cities was of a kind to deprive an individual, thrown among strangers, of many of the rights most necessary for his well-being. It was exceedingly difficult for him to find a new home. Nor were, at that time, social intercourse and the common habits of men founded upon so universal and broad principles as to allow the foreigner to feel himself at ease. The Florentine wept in Ferrara or Venice, for his home, his *patria*, we cannot say his country. It is far different now. An emigrant leaves the place of his birth, travels many hundred miles through a foreign country, crosses the wide ocean, travels a thousand miles into the interior of another hemisphere, and builds his hut. He is among strangers, it is true, yet he finds there the same dress, the same manners, the same principles of morality, the same God. There is a catholicism in modern morality, knowledge, and civilization, which makes an individual belonging to the European family feel easily at home wherever he may be within the pale of European civilization.—*Abridged from Francis Lieber's Stranger in America.*

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THE DRUSES.

[Djoumi, the Residence of the late Lady Hester Stanhope, in Syria.]

THE history of the Druses has long been a subject of inquiry and perplexity. This interesting people are scattered over Syria southward to near the sources of the Jordan, and northward nearly as far as the latitude of Tripoly; eastward they are found in the district of Haouran, south-east of Damascus; in the chain of Antilibanus; and the intervening plain which separates it from Mount Lebanon; but they are most numerous in the range of Libanus itself.

The authority of the emir of the Druses extends more or less over this territory, with the exception of some portions of its outskirts. The true seat of his dominion, however, is Mount Lebanon. He has under him several subordinate emirs; and recently some portion of the pashalic of Damascus has been added to his government by Ibrahim Pasha. The government of the mountain has been in the family of the present emir for nearly a century and a half. The construction of society resembles a good deal that which formerly existed in Scotland, the mountaineers being divided into clans. Hence the reigning emir has not been selected from the Druses, as that would have infallibly led to factions and family contests. The late emir was a Christian, and his household and attendants embraced the same faith, but from motives of policy he conformed with some of the Mohammedan usages, and he kept an even balance betwixt the various sects living under his rule. The Druses do not enjoy the advantages and protection afforded by legal tribunals; but their disputes are usually settled by the interference and arrangement of friends, and if this does not satisfy the parties, reference is made to the emir. On the whole, life and property are generally respected. The emir derives large revenues from his own domains, and the heavy personal exactions which are levied in the ill-governed parts of the East are unknown. The mountain is consequently regarded as a place of refuge and security, and is sought as an asylum by persons from all parts of Syria. The population is raised above that state of poverty and precarious dependence in which they are frequently placed in the neighbouring countries by their oppressive and despotic rulers.

The religion of the Druses is the most inexplicable part of their history. In the countries in which the Christian religion was first planted, wars, revolutions, and vicissitudes of every kind having overthrown the primitive churches, time and circumstances have corrupted in a singular degree the religious opinions of the sects which arose out of their ruins, and they exhibit a combination of Christianity, Judaism, and Mohammedanism. With these recognised characteristics is found the ordinary degree of human folly and weakness, which may be expected when men follow the dictates either of enthusiasm or superstition. The population under the emir of the Druses comprises Christians of various sects, of whom

the Maronites, who are the largest class, are Roman Catholics; and next to them in importance are the Melchites, or Greek Roman Catholics, so called from their having seceded from the Greek church. The Metawalies are the most numerous class among the Mohammedans. They adopt the doctrines and forms of the Persian Mohammedans, which differ from those entertained and observed by the Turks.

Since the Jesuit missionaries first prosecuted their labours in this quarter, the religion of the Druses has been an interesting subject of inquiry; and both Niebuhr and Volney endeavoured to ascertain its true character. They are not Mohammedans, and certainly cannot be regarded as professors of Christianity. Indifference to religion of any kind renders them the most tolerant of all sects, bad as is the source whence their conduct in this respect springs. In the presence of strangers they will fast during the Ramadan, the Mohammedan Lent, while at their own houses they pay no regard to Moslem rites, but eat even of the flesh of the wild boar and drink wine. Burckhardt says that it seems to be their usual maxim to adopt the religious observances of the most numerous sect about them; in fact, to join outwardly the strongest party. The tolerant disposition of the Druses would, it has been thought, render them favourable subjects for missionary instruction; but the Jesuits did not find this to be the case, and in the 'Lettres Edifiantes et Curieuses' it is stated that "their inviolable attachment for their religion, and still more their obstinacy in refusing instruction, give just reason to fear that this sect will persist in shutting its eyes to the light of the gospel." The Protestant missionaries have not been more successful in overcoming these impediments.

It was thought at one time that the investigations of the late Baron de Sacy had unravelled the mysteries of the religious practices and doctrines of the Druses; and in his 'Chrestomathie Arabe' he gave a translation of several Arabic manuscripts purporting to be their sacred books, from which he inferred their belief in the transmigration of souls, and that they paid adoration to a sheep or a calf. Mr. Buckingham hints that the object of their worship is something very different, though not at all better calculated to elevate and improve their moral character; but his views on the subject appear to be wholly conjectural. The religious organization of the Druses is well calculated for a secret religion. The people are divided into three classes—the 'Djahelin' or the ignorant, the partially initiated, and those fully initiated. The second class may again go back into the class of Djahelin if they think proper; but it is said they incur the penalty of death if they make known any of their mysteries, and it is also stated that the same punishment awaits them if they become either Christians or Mohammedans. They do not attempt to make proselytes. At their weekly meetings the initiated class often remain at their places of worship until a late hour; they are accused on these occasions of being guilty of licentious practices; and though there seems to be no very good ground for such a charge, it is repeated by successive travellers copying from the statements of their predecessors. Though their moral sense is probably feeble enough, the Druses are not loose observers of outward decorum; and it is remarked that a young Druse, on being initiated into the innermost forms and doctrines of his religion, abandons his previous bad habits. This, however, as Mr. Jowett observes, may arise from pride and the spirit of caste.

We are so little satisfied with collating different authorities on the religion of the Druses, that we think it more useful to the reader to show the opinions of two eminent authorities in their own words. Niebuhr, who devoted much attention to the subject, gives the following account of the religious constitution of the Druses:—"The Druses," he says, "are divided into Akals, that is to say, ecclesiastics, and Djakels, or seculars. The ecclesiastics are dependent upon three Akals, who are sheiks among them. The Akals are distinguished from the seculars by their white caps. On Thursday evening, which among the Orientals is called the night of Friday, they assemble in the house of one or other of their fraternity to perform their worship and pray for the whole nation: the wives of ecclesiastics may be present, but they do not admit seculars, not even a sheik or an emir. They despise all employments of honour in the world, but perhaps in this they make a virtue of necessity; for, on the return of Hakem (their founder), they hope to be kings, viziers, and pashas. They do not marry the daughters of seculars, and they even carry their aversion to the property of the great so far as not to eat with the sheiks and emirs of their own nation. Akals eat only with Akals, and with the peasants and other poor people, who, they are certain, earn their bread by labour."

Burckhardt, speaking of the Druses of the district of Haouran, says that the Akoul (plural of Akel) are not permitted to smoke tobacco; they never swear; and they are very reserved in their manner and conversation. "I was informed," he says, "that these were their only obligations, and it appears probable, for I observed Akoul boys of eight or ten years of age, from whom nothing more difficult could well be expected, and to whom it is not likely that any important secret would be imparted.* I have seen Akoul of that age, whose fathers were not of that order, because, as they told me, they could not abstain from smoking and swearing. The sheiks are for the greater part Akoul. The Druses pray in their chapels, but not at stated periods; and none but Druses are allowed to enter them." Of the Akoul of Mount Lebanon the same traveller says,—"They superintend divine worship in the chapels and instruct the children in a kind of catechism. They are obliged to abstain from swearing and all abusive language, and dare not wear any article of gold or silver. Many of them make it a rule never to eat of any food nor to receive any food which they suspect to have been improperly acquired. There are different degrees of Akoul, and women are also admitted into the order."

Such are the accounts most worthy of confidence; but the evidence on which they rest is not in every respect such as to entitle them to implicit credit; and, as Burckhardt himself remarks,—"the religious opinions of the Druses will remain for ever a secret, unless revealed by a Druse." No such revelation has yet been made, and all the accounts which we possess are but hearsay. Possibly, after all, the Druse religion may derive some part of its mystery from its incoherent and ill-understood doctrines. The best thing which can be said of this people is that they live in harmony with their neighbours, whether Christians or Mohammedans. This much appears to be certain concerning them, that they are or were originally disciples of the sixth Fatimah caliph of Egypt, who in the eleventh century proclaimed himself to be an incarnation of the Divinity, and established a secret lodge at Cairo divided into nine faculties, if we may so term them, the first of which taught the superfluousness of all religions and the indifference of human actions. The Assassins were a branch of this sect.

The vernacular tongue of the Druses is Arabic. The Maronites have a college for the study of Syriac; and the Melchites have also a college. There are besides a number of Christian convents scattered in the mountain.

Our cut gives a view of the residence of the late Lady Hester Stanhope, amidst the barren but majestic mountains near Saidee (the ancient Sidon). It consisted of ten or a dozen compartments, of one story, resembling so many small cottages, and afforded accommodation for herself, household, attendants, and occasional visitors. Lady Hester resided above twenty years in Syria. She was a

* This statement appears to be very inconclusive.

grand-daughter of the first Earl Chatham, and niece of Mr. Pitt, and during her uncle's administration was well known in the most brilliant circles of fashion and politics in London. On the death of Mr. Pitt she went to France, then proceeded to Italy, Greece, Constantinople, Cairo, and was the first European lady who visited the pyramids of Gizeh. During her wanderings she was wrecked on the island of Cyprus, and lost much valuable property. Palmyra and the principal objects of interest in Syria also attracted her, and being pleased with the climate, scenery, and manners of this part of the East, she determined to make it her residence, adopting, as the only costume which the habits and manners of the country rendered most convenient to one in her circumstances, the dress of a Turkish effendi, or private gentleman. Lady Hester was held in high estimation by the mountaineers of Lebanon and the people of the adjacent districts, by whom she was generally called the Princess or the King's Daughter; and the pension she enjoyed from the English government was often liberally employed in contributing to their welfare. Lady Hester Stanhope died at her mountain residence, last year, being in her sixty-third year.

[To be continued.]

THE NEWCASTLE IMPROVEMENTS.

There is perhaps no town in England whose present condition, either in itself or in connection with its former history, is more worthy of study than that of Newcastle-upon-Tyne. So many persons know nothing of its present aspect, so many conceive of it merely as a smoky place strewed with coals, dismal by day with its yawning pits, and by night with its lurid fires, that we are tempted to give such an idea as can be conveyed by words of the beauty and splendour of which it has now to boast,—the greater part of which it owes to the genius and industry of one man.

Newcastle-upon-Tyne owed its origin to the spirit of war,—its establishment, to that of religion,—and its increase, to that of commerce.

The earliest notice that seems to have been taken of the hills and dell on which it is built was by the Romans, nearly 1800 years ago. The great wall which the Romans built across the narrowest part of England, ended near these hills, running from the Solway Frith to a point on the banks of the Tyne, three miles east of Newcastle, and called Wallsend at this day. To protect the termination of this wall, a military station was established on the spot on which the town now stands, and called at first *Pons Elii*, and afterwards *Ad Murum*. In those days, the sentinel beheld from the wall a very different scene from that which now meets the eye from any elevation near. The Cheviots rose on the horizon in clear days then as now; and the town-moor spread northwards green and lighted up with ponds, as at this day; but instead of the busy town, the Roman barracks crowned the rocky banks of the ravine, none but the soldiers drew water from the clear brook which ran through it; the Tyne, now crowded with craft, then ebbed and flowed in stillness in the valley below; while the green hills on either side were bare of the mansions, churches, furnaces, and other works which now rise to the view of the spectator. No superstitions were then connected with the locality; and nothing was known of the mineral treasures which lay beneath those green pastures, and which have since determined the occupation of the district and the character of its inhabitants.

In a subsequent age the spring at the head of the ravine came to be considered holy, and an eminence at hand was named Jesus' Mount (now Jesmond). Pilgrims travelled from great distances to this holy well, and the road by which they approached Jesmond is now one of the principal streets of the town, still retaining the name of Pilgrim Street. Several monasteries rose round about; and what had been *Pons Elii* became *Monkchester* (the city of the monks). These particulars of the early days of this town are derived from historical records, and established by the evidence of remains which have come to light from time to time,—buried altars, coins, and vestiges of buildings.

The religious erections remained in high reputation when Robert Curthose, son of William the Conqueror, restored to the place its military character by building a fortress. The New Castle (from which the place has ever since been named) was his work. It stands on a rising ground above the north bank of the river, and its lofty keep is one of the most striking objects to the eye of a stranger on approaching the town.

The Augustin Friars' monastery was perhaps the principal religious establishment of the place, or at least the most grandly patronised. The old historians say that the kings of Northumberland were buried in it; and the kings of England made it their abode when they came northwards with their armies to make war with Scotland. The nunnery was remarkable for having received within its walls, in 1086, Agas, the mother of Margaret, Queen of Scotland. It will be seen hereafter what became of this nunnery. The monastery of the Black Friars was founded in 1251, by Sir Peter Scot, the first mayor of Newcastle, and in its church Edward Baliol, King of Scots, did homage to Edward III. of England, on the 19th of June, 1334. Remains of this monastery may yet be seen near Low Friar *chace* (lane, or narrow street).

As the number of religious establishments increased, more and more persons settled in their neighbourhood. The ground first covered was the steep slope of the hill by the river side, where, as we have said, the castle was built. This hill-side became covered, in time, with narrow and winding streets and lanes of dwelling-houses, and here stand all the public buildings but those of modern date. The Townhall or Guildhall is there,—a very ancient building with a new face. The venerable north front and lofty steeple which once distinguished it now remain only in prints of the old town. The architect of this building, and of the Exchange, Robert Trollope, lies buried in Gateshead churchyard, under the following remarkable inscription :—

"Here lies Robert Trollop,
Who made yon stones roll up;
When death took his soul up,
His body filled this hole up."

By degrees, the settlements extended backwards to the ridge of the hill parallel with that which rose above the river; and afterwards the ravine between was occupied. What has been done with this dene or dean (from which Dean Street is named) will be seen hereafter. It is about sixty years since the streets erected over this valley became the most busy and fashionable parts of the town.

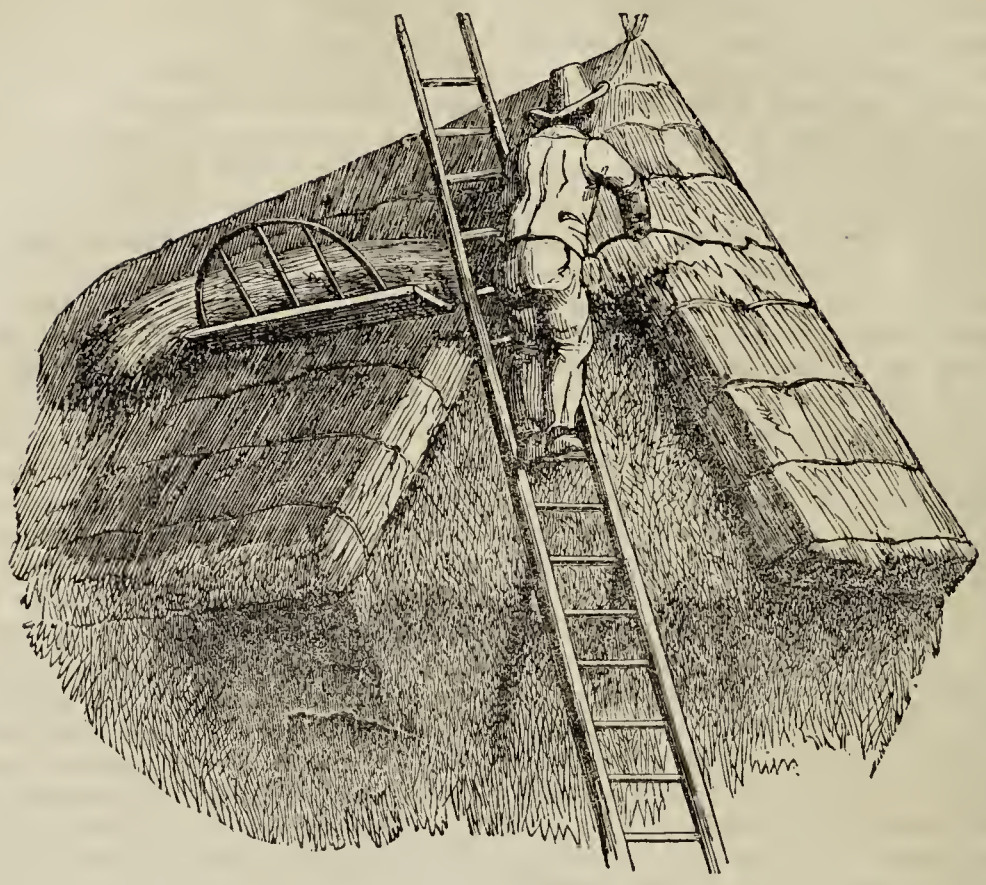
In consequence of the working of the coal-fields of the district, the establishment of the glass-manufactory, and its vicinity to the sea (from which it is distant only ten miles, with a navigable river between), Newcastle long ago became a place of great commercial importance. Its size has more than doubled, and its population nearly so, within the present century; and it is, in both respects, perpetually on the increase.

In 1819, when the great benefactor of the town, Mr. Grainger, seeing the great capabilities of the locality, began to form his schemes of improvement, the town presented a generally shabby appearance, the streets were circuitous (a large central space being occupied by the nunnery grounds), and the population, consisting of 43,000, was too much crowded, especially in the lower part of the town. What has since been done, chiefly through the energy and genius of this gentleman, for the embellishment of the place and the accommodation of its inhabitants, we shall proceed to relate.

[To be continued.]

COTTAGES.—THATCHING.

[Continued from No. 509.]



[Thatcher in Normandy.]

In the early period of our history, oak shingles were used as a covering for roofs, but this eventually became too expensive, and has long been abandoned. In a few village churches in the south of England the old shingle roof still remains. There was also a time when some even of our best churches were constructed of oak and covered with thatch. This was in the seventh and eighth centuries. But thatch of straw or reed also ceases in time to be the most economical covering; and the quarry, the kiln, or the mine must be looked to for a cheaper and better substitute—that is, slate, tiles, or metallic plates must be used. Lead is the best covering of all, and slate is inferior to it only, and is much superior to tiles, whether made in a concave form or quite flat. This has been placed beyond all doubt by actual experiment. Two pieces of slate and a common pantile being immersed in water for an equal length of time, the tile imbibed moisture to the extent of one-seventh of its weight, and the slate only the two-hundredth part; and both pieces being placed in a room where the temperature was 60°, the slate attained its former dryness in half an hour, while the superabundant moisture of the tile was not entirely exhausted at the end of six days. In some parts of Scotland, pantiles cannot be used unless defended from the weather by a covering of heath or straw.

Boswell, the biographer of Johnson, notices, in his account of their joint 'Tour to the Hebrides,' that one day "Dr. Johnson talked both of threshing and thatching," and he tells us what the great man said, namely, that "a roof thatched with Lincolnshire reeds would last seventy years, as he was informed when in that county, and that he told this in London to a great butcher, who said he believed it might be true. Such," adds the admiring biographer, "are the pains that Dr. Johnson takes to get the best information on every subject." Marshall, in his 'Rural Economy of Norfolk,' published a few years afterwards, tells us that a reed roof will last fifty years without requiring any repair; and thirty or forty years longer with adjusting and levelling the hollows with a little fresh reed. At a hundred years old it may be relaid, and will then, if laid upon the upper part of the roof, last through a considerable part of another century. The reed here spoken of is cut from the margins of ponds and meres; and a similar material appears to be used in thatching the New Zealand huts, as shown in the engravings at pages 94 and 101. Straw is less durable; and a roof covered with thin turf, straw, and clay will not last above seventeen or eighteen years. The durability depends in some degree upon the preparation of the material and the neatness with which it is put on; and the nature of the climate has also considerable influence. In some parts of Scotland, where fern is used to cover the roof, that which is laid on the south or sunniest and driest side of the house will last for eighteen or twenty years, or even longer, while the same material, when it has to encounter the damp and the elements on a northern aspect, will endure only half the time. The best position for a thatched building is in a diagonal line; that is, presenting no front exactly to either of the four quarters.

In the Irish Poor Inquiry, quoted in the last number, it is stated of the cabins in the county Limerick, which are nearly all thatched, that the roof often requires repairs, and that it must be renewed every seven years at the furthest. The great degree of moisture which prevails in Ireland, and the incomplete manner in which the operation of thatching is performed, will most probably account for the short duration of the thatch. In the west of England the straw intended to be used for thatching is combed quite clear of weeds, and the ears of corn are cut off, so that the straw is put on unbruised, and it resists the wet much better in consequence. The best kind of straw is wheat or rye straw. Where, however, little pains are taken in thatching, as in Ireland, this sort of roof is far from being economical in the long run. In the small towns, owing to the dearness of straw, the labourer puts off the repair of his cabin roof until it has begun to rot, and in the country the cottier is tempted to convert his scanty stock of straw into manure, or, if he has a cow, into food for her during the winter.

Farey, in his 'Agricultural Survey of Derbyshire,' written about thirty years ago, in noticing the cottages of the labouring class, tells us that "fortunately no consi-

derable quantity of straw is in Derbyshire devoted from the more important purposes of litter and manure." Since this period the value of straw has much increased, and at present it is sold in the corn-chandlers' shops in London at a half-penny per lb. for the truss of 36 lbs., or about one-third the price of bread fifty years since; and in remote parts of the country, straw is worth about 42*s.* per ton.* Tenants are generally bound to consume upon the farms all the straw which it produces, and this circumstance, together with the increased value of litter for manure, will account for the high price. In the course of no very long period the thatched cottage of rural poetry will no longer be seen; and at present a new cottage thatched with straw is confined to a very small number of places. A thatched roof requires to be formed in a more acute angle than one covered with tiles, and consequently more timber is required for the rafters, the great expense of which, in consequence partly of the timber duty, is also an additional reason for not using thatch. There are, however, many persons who are somewhat enamoured of a thatched habitation; but if they have any regard for their comfort, let them not be seduced so far by appearances as to take up their abode in a thatched villa, as it abounds with nuisances of which they are little aware. Mr. Loudon, in his work on 'Suburban Villas,' has feelingly depicted these miseries:—"Such cottages have perhaps the gable end covered with ivy, the chimney tops twined with Virginia creepers, and the windows overshadowed by roses and jasmines. The ivy forms an excellent harbour for sparrows and other small birds, which build there in quantities in spring and early in summer, and roost there during winter. In June, as soon as the young birds are fledged, all the cats in the neighbourhood are attracted by them, and take up their abode on the roof of the house every night for several weeks; the noise and other annoyances caused by which we need only allude to." Insects are also generated in the thatch, and find their way into every corner of the house; snails and slugs are also harboured in cottages of this description. Then there is the additional risk of fire, and the injury occasionally done by high winds cannot be readily repaired, for the services of a skilful thatcher are not to be so easily obtained as those of a slater or bricklayer. Mr. Loudon is of opinion that in a thatched house or villa three servants would be necessary where two would suffice if the roof were covered with slate or sheets of lead. The equability of temperature which is enjoyed under a thatched roof is therefore an expensive and very partial advantage.

We need not however fear that the art of thatching will be lost. It must always continue an important branch of rural industry, for though the hay farmers around London may possibly find it more economical in the end to lodge the produce of their fields in a barn, yet in every other part of the country a well thatched stack is a much cheaper mode of protection from the weather; and even in Middlesex there is a prejudice against hay which has stood in a barn, as it is thought to lose some of its fragrant qualities. It is perhaps scarcely requisite to enter into any lengthened detail of the mode in which thatching is performed: an opportunity of watching the operation would be far more instructive on this point than the minutest description. The straw is well moistened with water, drawn out in handfuls perfectly straight, and if the work is intended to be very neatly performed, is put into regular lengths. It is laid on to a considerable thickness and firmly secured by ropes or twisted straw, and pinned down by sharpened sticks called 'broaches;' but in thatching cottages the latter are sometimes dispensed with, as, without they are carefully used, they are apt to conduct the wet into the midst of the thatch. Only two or three tools are used, which are very simple. One is an iron-toothed rake, for smoothing the layers of straw, and another, called a 'legget' in some parts of the country, is a board studded with large-headed nails, and having a handle two feet long, which is used for producing a level and uniform surface. The following account of the operation of thatching is taken from one of the valuable publications of the Highland Society of Scotland. "In laying on the thatch the thatcher stands upon a ladder resting upon the sloping conical roof of the rick, as near as he can to the eaves, and lays on the thatch in handsful, from sheaves placed within his reach. He thrusts the inner end of his handful of thatch, gathered into a neck or wisp, into the butts of the sheaves, and spreads out the lower end like a fan, overhanging the eaves; then covering as much of these as he can reach at arm's length, he works upwards, crossing each successive handful to overlap that immediately below; and he thus covers the roof in triangular portions, till he has gone round the whole backwards, that he may avoid treading on his work. When he has reached the top of all, he lays a considerable thickness of short straw upon the crown, over which a straw rope is carried perpendicularly, dividing the roof into two equal sections. He then covers this topping of short straw with long thatch drawn to a point at the summit, and ties the upper end of this with a small straw rope into a peak; giving this last part the appearance of an umbrella. With the aid of two assistants on the ground, while he remains aloft on the ladder, so as to be able to reach the top with his hands, the thatcher now places a number of well-twisted ropes of tough oat-straw to lace down the cover and secure the thatch. These obliquely embrace the roof in the lozenge fashion, and are fixed below, either to the butts of the sheaves, or to a belt-rope firmly bound round the body below the eaves."* Half a load of straw (between five and six cwts.) will cover one hundred square feet.

The cut at the head of this article represents a thatcher at work upon a stack in Normandy. The work appears to be performed with unusual care, though the process is somewhat different from that usually pursued in this country. It is not often that the French agriculturist does his work with so much attention to neatness as our cut shows to be the case in this instance; and in fact the climate does not demand it.

[New Zealand Hut and Garden Fence.]

THE ROYAL TOUCH FOR THE KING'S EVIL.

The disease termed scrofula consists in the deposition of a soft cheesy matter in various organs. This, which may remain quiescent and unaltered for a longer or shorter period, upon the occurrence of any cause of irritation may be converted into a substance called pus, or, in popular language, matter—forming thereby abscesses of a small or great magnitnde. The scrofulous habit is that state of system in which these deposits are likely to occur: and it is often hereditary. Almost any organ

* An acre of wheat will yield about a ton and a half of straw.

* 'General Report of Scotland.

may thus become diseased; but it is especially the bowels in children, and the lungs in adults, which suffer. Externally it is generally in the neck that it is visible, affecting numerous glands which are there situated; the glandular system being especially obnoxious to this morbid influence. Persons, then, having these glands swollen, are said to be affected with scrofula, or the king's evil. This latter appellation is derived from the supposed power the royal touch possessed in curing the affection. It is proposed to give a short account of this popular delusion, abridging for that purpose two papers which appeared in the Edinburgh 'Medical Journal' several years since:—

William of Malmesbury states that it is to Edward the Confessor we are to attribute the origin of this power—which has descended to his lineal successors; the kings of France deriving the privilege only from their alliance with our royal family. The practice continued in vogue for nearly 700 years; for the celebrated Samuel Johnson was touched by Queen Anne, upon the recommendation of Sir John Floyer, a distinguished physician of Lichfield. The practice was carried to the highest point in the reign of Charles II., who is said to have lain his hands on 6000 persons in one year. But many of this number were doubtless only pretended, in order to obtain a small piece of gold which the king suspended from their necks. To check any imposition of this kind, the patients were obliged to undergo a preliminary examination, and procure a ticket from the king's surgeon. This functionary also attended at the touching, presenting on his knee each patient to the king. The clerk of the closet presented the gold to the king, while a chaplain read prayers. Sunday was the day usually appointed. In winter the ceremony took place at Whitehall, in summer sometimes at Windsor. An exact register of cases was kept, and the whole amount is almost incredible. From 1660 to 1664 inclusive, 23,601 persons were touched.

The *Mercurius Politicus*, 1660, contains the following passage. "In this manner his majesty stroked above 600; and such was his princely patience and tenderness to the poor afflicted creatures, that though it took up a very long time, his majesty, who is never weary of well doing, was pleased to make inquiry whether there were any more who had not been touched. After prayers were ended, the duke of Buckingham brought a towel, and the earl of Pembroke a basin and ewer, who, after they had made obeisance to his majesty, kneeled down till his majesty had washed." The *Parliamentary Journal* for July, 1660, after stating that by reason of the king's return, after a long absence, multitudes flocked to be cured, and that it was found necessary to limit the number to 200 each day, adds, "who are first to repair to Mr. Knight, the king's surgeon, being at the Cross Guns, in Russel Street, Covent Garden, over against the Rose Tavern, for their tickets. That none might lose their labour, he thought fit to make it known that he will be at his home every Wednesday and Thursday from 2 to 6 o'clock, to attend that service: and if any persons of quality shall send to him, he will wait upon them at their lodgings upon notice given to him."

In a book published expressly upon the subject by "John Browne, one of his majesty's chirurgeons in ordinary, and chirurgeon of his majesty's hospital," London, 1684, sixty cures are minutely and circumstantially detailed; as also several scrofulous tumours and sores, which disappeared, on being touched by handkerchiefs dipped in the blood of Charles I. Browne seems to have been a practitioner of established reputation, for his book is stamped with the approbation of the College of Physicians and the most eminent surgeons of the day. He relates cures the king performed during his exile, and declares that Cromwell tried in vain to exercise this royal prerogative. Wiseman, the author of a standard work on Surgery, says, "I myself have been a frequent eyewitness of many hundreds of cures performed by his majesty's touch alone, without any assistance from chirurgeons; and those among them who had tired out the endeavours of able chirurgeons before they came thither."

In explanation of witnesses, apparently so well qualified, delivering what now seems to us such absurd opinions, the writer of the papers continues: "The belief in the royal touch was evidently a party tenet; it was therefore encouraged by the sovereigns, and upheld by all who were disposed to please the court; and it was never openly attacked by those who might not give credit to it, through fear, probably, of incurring the suspicion of being disaffected to the government. Wiseman quotes no case from his own private practice for which he ever prescribed this remedy, although he has described his own mode of treating scrofulous diseases with sufficient minuteness. The same patients applied to be touched more than once, which proves the remedy was not always effectual, and that it was not universally thought so. Both Wiseman and Browne were warmly attached to the king's party, and they might encourage the common error by conniving at the general belief of the unlimited powers of the crown. In fulfilling their duties as examining surgeons, they were cautious what cases they admitted; all complaints were not allowed to come indiscriminately before the king; and the most unpromising cases of scrofula were not submitted to the royal hands. Some of the cures may thus be satisfactorily accounted for: faith will do much towards making the diseased whole; and experience shows what influence the state of the mind has upon the ulcers and wounds in hospitals and camps belonging to a victorious or to a conquered army. The sensibility of the system, in weak scrofulous habits, would be roused into action; and their complaints would be indirectly affected by the imagination, which must have been powerfully struck by the magnificent splendour of the ceremony.

"Let us suppose a poor ignorant peasant labouring under some scrofulous disorder and desirous of being cured, brought from a distance in the country to the metropolis, and led with great pomp before his sovereign, and an august assembly, where he is submitted to a mode of treatment of which he has heard such wonders, and from which he is convinced beforehand he shall experience prodigious benefit; is it not likely such a patient would really receive some benefit from being touched? Moreover, slight cases undergo spontaneous changes, especially in warm weather, and the approach of summer would therefore assist the operation of the ceremony, performed in the month of March or April.

"With regard to the healing efficacy of a handkerchief dipped in the blood of Charles I., that is very well attested by competent witnesses in Browne's book, and it seems the highest effort of enthusiastic loyalty. Nothing can go beyond it; and in any other country but this, our wonder would be excited to hear of anybody's credulity going so far. But the various pretensions and impostures daily practised by quacks afford an irrefragable proof of the credulity of the English.

"In the last century, Sir Kenelm Digby pretended to have discovered a sympathetic remedy, which cured wounds solely by rubbing it upon the instrument which inflicted them. One Greatrex used to cure many disorders by stroking, and the early volumes of the 'Philosophical Transactions' show how this impudent fellow practised upon the celebrated Boyle and others."

A sensible writer observes upon this subject: "It was enough to refute the impudent claims of the alchemists, that these pretended gold-makers were beggars in rags; and it is a convincing proof that the royal touch cannot cure the king's evil when it becomes the evil of kings. For my own part, indeed, I cannot help wishing this royal remedy for scrofula had not gone out of fashion, if it ever could be of any service. I wish, most heartily,

that all remedies would answer the encomiums bestowed upon them, that kings as well as commoners could heal the sick, and newspaper doctors prove for once infallible; so should we get rid of the *opprobria medicorum;* so should we set at nought that first and most uncomfortable aphorism of Hippocrates,—'For surely that art were soon attained, that hath so general remedies; and life could not be short were there such to prolong it.'"

As somewhat connected with the subject of this paper, we may allude to the disgusting practice, which existed even in the recollection of many of our readers, of applying, by means of the hangman, the hand of an executed criminal to the tumours on the necks of women, termed wens. May we not add a hope, that speedily executions themselves will become as obsolete as has this disgusting accompaniment.

BEAVERS AND BEAVER-MEADOWS IN NORTH AMERICA.

[From a Correspondent.]

The common beaver is not only an inhabitant of the northern continental regions of the old world, but throughout the whole extent of the continent of North America—at least in all the higher latitudes; for wherever the country has been explored, up to the present time, invariably have these animals been met with. The species appears to be the same on both continents, although many early writers on the natural history of America appear to have been of opinion that their customs and habits (if the expression be applicable to quadrupeds) are somewhat different; for they, one and all, ascribe a superior degree of sagacity and industry to the beaver found in the western world. This however is a very doubtful case; and later observation seems not to have borne out the views and opinions of those early writers.

There seems no doubt that beavers were more abundant in the country now forming the northern section of the United States, including the British colonies, and so westward by the Great Lakes, than in any section of the continent of Europe or Asia with which we were then familiarly acquainted; and as the fur of the beaver was one of the most valuable products for many years exported from North America, it is by no means singular that the early explorers of that country should have boasted of its abounding in what they knew would render it more valuable in the eyes of the nations of Europe. Besides, there is no doubt that a large portion of that part of the North American continent of which I am speaking, from its local peculiarities, is better adapted to the tastes and habits of the beaver. Abounding with lakes, rivers, and innumerable small streams, and with food agreeable to their tastes, and but a small portion of it being very mountainous, it naturally presents every inducement for these sagacious animals to propagate their species in. But although at one period these animals were found in considerable numbers in districts of country where there is not one to be met with at present—yet in most instances where colonies of these animals were found, their numbers were often greatly exaggerated. Indeed the caves or burrows of the beaver were invariably found in situations that, without an actual demolition of the entire village (if their habitations might be called such), it would have been impossible to come at the exact numbers. And even admitting that that point could have been ascertained, how were the beavers to be enumerated, when Buffon and some other writers state that sometimes two, sometimes five or six, and even as many as eighteen or twenty inhabit a single hut?

The beaver being naturally a shy and timid creature, it flies from its accustomed haunts as the country becomes inhabited by the human race; although it would appear that when the country was first visited by Europeans, it was by no means unusual to find a colony or two of beavers in the immediate vicinity of an Indian settlement; and though the Indians destroyed them for the sake of their skins, they were not considered near so valuable to the aboriginal inhabitants as those animals whose skins could, as well as the beaver skins, be converted into clothing, and whose flesh formed a favourite and palatable dish of food. But a short acquaintance with Europeans converted the Indians into the most daring and subtile enemies the beavers have ever had; for in all the large fur-trading establishments it has been the prevailing custom to employ Indians to hunt the beaver, as well as other wild animals, whose skins are considered worth the trouble of hunting; the fur-traders furnishing the Indians with traps and other necessary engines of destruction. Had the flesh of the otter and the beaver been palatable to the taste of the Indian tribes of North America, in all probability along the rivers and lakes, where numerous savage tribes were located, very few of either would have been found when the country was first explored by Europeans. It seems not a little singular that the tastes of these savages should have been found to assimilate so closely to the tastes of civilised and refined nations with regard to the flesh of these animals and several others; as well as to numerous kinds of birds, particularly water-fowl. The Indians, generally, are fond of flesh, for to many of their tribes fish forms the greater portion of their sustenance; and yet where the flesh of animals, such as the otter and beaver, has no disagreeable flavour (particularly the latter) except that it tastes a little fishy, they reject it, although they are fond of fish. The flesh of the beaver is, however, during the winter season, when they become fat, eaten and relished by the hunters in the north-west. (See 'Penny Mag.,' 1833, page 130.)

Besides the valuable fur of the beaver, an article so generally used in the manufacture of hats of a fine quality, that the term 'beaver' has become, in many instances, synonymous with that of hat, these animals also produce the medicinal drug known as *castoreum* or castor, which, of course, tends to increase their value. In the shape of this animal there is nothing very peculiar—excepting its tail, which is about a foot long and five inches broad, and covered all over with scales like a fish. Indeed the tail seems a most useful appendage, for the beaver makes use of it as a trowel in plastering the interior of its habitation with moistened earth or clay, and it also makes a capital scull when this animal travels in or under the water. The head is short and rounded, and the whole body is shorter and thicker than that of the common otter.

These animals commonly congregate in parties, sometimes amounting to a score or two, and sometimes even to hundreds. But this is not the case invariably, for in the forests of America they are occasionally found in solitary pairs. When this is the case their fur is not considered equal to that of the community beaver, although they appear to be of the same species. From the opinions I have been able to form during a long sojourn in various parts of the American continent, which once were favourite haunts of the beaver, but from most of which they have been scared away, as well as from the opinions of other individuals, whose opportunities of coming to a correct judgment have even exceeded my own—there seems little doubt but the accounts of their making such perfect, and, I may almost say, scientific dams across streams and rivers, have been painted in imaginative colours; as have, also, those relations connected with the building of their habitations when living in numerous societies. Admitting that they possess all the sagacity that Buffon or any other writer on natural history has thought fit to assign to them, it is quite impossible that they should perform works of that magnitude, and where so much strength or power was absolutely necessary, as we have been informed was the case.

Although it has occasionally been stated that the beaver

never eats fish, or at all events if it can procure otner food, a better acquaintance with its habits has proved this not to be the case; for there have been several attempts made in America within the last thirty or forty years to domesticate the beaver, and thus turn beaver-breeding to a profitable account, where these animals have appeared somewhat partial to certain kinds of fish, particularly to eels, mullet, and some other sorts found in ponds and muddy waters. To be sure, under confinement, they have not had opportunities of rambling into the forests in search of what has been considered their usual and favourite food, the fresh bark of various sorts of trees; for although they are known not to reject some sorts of bark after it has been hoarded up for several weeks during the severest part of winter, when the snow is too deep for them to roam abroad, yet when in confinement they might show less partiality for this sort of food than when collected by themselves and in a manner the most congenial to their tastes and habits. Those parties, however, alluded to who have made the attempt at domesticating the beaver have never yet been able to turn the matter to much account; for notwithstanding one person with whom I was acquainted succeeded in increasing his stock to upwards of twenty (having commenced with a couple, male and female), he soon afterwards gave it up as hopeless, the attention they required being so great, particularly during winter; and he also found that the fur of all the younger ones, bred in captivity, was considerably inferior to the fur of those found in a wild state. Though they frequently produce three, and even four, at a birth, this gentleman's tame ones never produced more than a couple, and many of the young died shortly after their birth. He was well acquainted with their tastes and habits previous to his embarking in this business, for he had been a fur-trader in the remote fur-districts for many years; and he took care to provide them with plenty of water, and built for them similar dwellings to those he had witnessed in the beaver colonies, yet, after all his labour and expense, he was obliged to relinquish the hope of making a fortune by beaver-breeding.

In some parts of the country, indeed in almost every part of it where the surface is somewhat hilly or broken, those swampy pieces of ground universally called Beaver-Meadows are found in the American forests. In many places I have seen them occupying nearly every little hollow or valley between the various headlands of branch brooks and streams; so that if they ever have really been, as is generally believed, the abodes of colonies of beavers at some past and remote period, we may reasonably conclude that, in those situations so peculiarly adapted for the haunts of these animals, their numbers must have been very considerable indeed when these meadows were inhabited by them. From the hilly districts bordering upon the river and gulf of St. Lawrence westward through New Brunswick and all the upland country, from thence through all that section of the United States until we reach the great valley of the Mississippi, beaver-meadows are more or less numerous; although through all this vast range of country, a great portion of which has become peopled by the human race, at the present day but very few beavers are found. Most of them have undoubtedly been destroyed; but in some cases they have sought for safety in the yet unreclaimed forest, constantly receding at the approach of man.

It seems, however, very doubtful that *all* those swamps, marshes, or grassy ponds were reduced to the condition we find them in by beaver at all; but rather that they are the original and natural features of the country, since many of them show nothing like the remains of beaver-dams, which once must have existed where they are really beaver-meadows. With some the case is different, for even at the present time the remains of something in the nature of dams or embankments can still be traced. But here it must be observed that in no situation or single instance could I ever discover the remains of a beaver-dam of any great extent,—nothing approaching the dimensions that have sometimes been assigned them. The situation of these dams is, however, invariably the very best that human judgment or beaver sagacity could possibly have made, that is, the dams have been built in situations where the smallest amount of labour produced the greatest effect. Their efforts, however, as far as I have been able to extend my observations, have never extended to the stopping up of deep channels or broad or rapid streams. Generally they have only undertaken to obstruct the passage of gentle brooks or infant streamlets, where the prostration of a few young trees or saplings, at the season of the year when the timber is in full leaf, was no inconsiderable step towards the completion of their object. And since the small streams are many of them nearly dried up during the latter part of summer, the completion of their labours would have little or nothing to retard it. But these beaver-meadows, or the greater portion of them, must originally have been meadows or low places, else a dam with an elevation not exceeding three or four feet (and I am inclined to believe that few of them have exceeded this) could not have laid a considerable space under water. And what strengthens the opinion of many, that what are considered as beaver-meadows never have been such, are the small deep ponds and pools often existing in various parts of them, which, if they had been dry land originally, could not have been the case.

In those sections of country devoid of prairies, the beaver-meadows are the only places destitute of timber when the forests are first explored, and some of them yield the first settlers a supply of coarse grass during the period they are subduing a portion of the woods, when they have no means of procuring a better sort. They are not, however, invariably covered with coarse grass or flags, for some of them are overgrown with dwarf alders; while others again present an almost impenetrable grove of the large-leaved laurel or rhododendron. Where there is a considerable fall in the streams that flow from or through the beaver-meadows a little below their outlets, as the country becomes settled, in many instances, dams are erected, and they thus become again overflowed; and, at some short distance down the valley, grist and saw mills are built, but particularly the latter; and although they never again become the resort of beaver, they are often converted into useful reservoirs, the contents of which are applied to sundry useful purposes. When laid dry by draining, and afterwards cultivated, the beaver-meadows become the most valuable lands in the upland districts.

Advice to Cottagers.—The following extract from the 'Useful Hints' published monthly by the Labourer's Friend Society shows the way to make an humble cottage the abode of cheerfulness and content:—"Nature is industrious in adorning her dominions, and the man to whom this duty is addressed should feel and obey the lesson. Let him too be industrious in adorning his dominion—in making his home, the dwelling of his wife and children, not only convenient and comfortable, but pleasant. Let him, as far as circumstances will permit, be industrious in surrounding it with pleasing objects; in decorating it, within and without, with things that tend to make it agreeable and attractive. Let industry make it the abode of neatness and good order; a place which brings satisfaction in every inmate; and which, in absence, draws back the heart by the fond associations of comfort and content. Let this be done, and this sacred spot will surely become the scene of cheerfulness, kindness, and peace."

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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HORSE ARMOURY IN THE TOWER.—IV. EDWARD IV.

[Edward IV.]

CHIVALRY, which formed so distinguishing a feature in the manners of the middle ages, and which had flourished greatly in England in the fourteenth century, began sensibly to decline at the period at which we have now arrived.

In the fifteenth century the people were so much engaged in real warfare, that its mimic representations in tilts and tournaments were neglected; and during the unfortunate contests between the houses of York and Lancaster, when the kingdom was almost depopulated by its internal dissensions, the minds of the contending parties became so vitiated, and the animosity entertained by each against the other raged with such fury, that all chivalric feelings appear to have been totally banished. The demoralization produced by these wars was not at all confined to the lower orders; it exhibited itself with even greater violence among the higher classes; and nobles and princes promulgated sentiments not only at variance with their vows of knighthood and honourable bearing, but opposed to the principles of justice and the first laws of humanity. Of Edward IV., whom Philip de Comines describes as "a man of no great forecast, but very valiant, and the beautifulest prince of his time," the historian relates the following anecdote:—"Now you shall understand that the custom in England is, after the victorie obtained neither to kill nor ransoume any man, especially of the vulgar sort, knowing all men then to be ready to obey them, because of their goode successe. Notwithstanding, King Edward himself told me, that in all battels that he wan, so soon as he had obtained the victory, he used to mount on horsebacke, and cry, 'Save the people, but kill the nobles.'" This anecdote receives confirmation from the number of nobles and men of family who lost their lives in these wars, a number so large that a sufficiency of gentlemen could with difficulty be found to carry on the civil government of the country. It has been said that from sixty to eighty nobles and princes of the blood-royal lost their lives in this quarrel, either in battle or on the scaffold.

But the decline of chivalry in the fifteenth century, con-

sequent on the internal disquiets of the kingdom, as well as on the French wars, was much influenced in the reign of Edward by the habits and disposition of the king. Although there is ample proof that Edward was a warrior of great valour and address, and not at all wanting in energy when the time came for exertion, it is equally admitted that naturally he was more inclined to the quiet of peace, when he could indulge his disposition for pleasure and gallantry, for which his handsome figure, engaging manners, and elegant address more fitted him than for the rough and laborious employments of war. It would have been well had such a disposition been innocently indulged; but it is difficult for all men to keep their passions within reasonable bounds, and a prince, to whom the gratification of his desires is more practicable than to most others, finds a corresponding increase in the difficulty of curbing them. Edward allowed himself no reflection; he plunged into the greatest excesses, and almost all the disorders of his reign and the calamities that befel his friends and family may be traced to the extravagances into which he was hurried by the gaiety of his disposition and his love of pleasure. But the consequences of such conduct, however observable they may be in after-times, are not appreciated at the moment; and thus the courtiers, who followed the example of the king, gave no thought to the future.

The decline observable in the chivalric bearing of the age was a natural consequence of the vices generated by idleness; and Caxton, when he endeavours to recal the knights of his time to a sense of their duty, feelingly laments their dissolute behaviour. "O, ye knightes of England!" exclaims he, "where is the custome and usage of noble chivalry that was used in those dayes? What do ye now but go to the baynes and play at dyse? And some, not well advysed, use not honest and good rule, again all ordre of knyghthode. Leve this, leve it, and read the noble volumes of St. Graal, of Lancelot, of Galaad, of Trystram, of Perse Forest, of Percyval, of Gawayn, and many mo; ther shal ye see manhoode, curtosyc, and gentylness. I would demaunde a question, yf I should not displease: how many knyghtes ben ther now in England, that have th' use and th' exercise of a knyghte? that is to wite, that he knoweth his horse and his horse him. I suppose, and a due serche should be made, there sholde be many founden that lacke; the more pyte is. I wold it pleased our souverayne Lord, that twyse or thryse a-yere, or at the lest ones, he wold do cry justis of pies [jousts of peace], to th' ende that every knyghte shold have hors and harneys, and also the use and craft of a knyghte, and also to tournaye one against one, or two against two, and the best to have a prys, a diamond, or jewel, such as should please the prince."

But if the true chivalric spirit, which had before rendered the actions of knights alike gallant, honourable, and commendable, no longer animated them with the desire of rendering themselves famous for the purity and bravery of their enterprises,—the ambition of surpassing each other in dress and the splendour of their equipments, which had now become a ruling passion with most young noblemen, caused them to continue in some degree the jousts and tournaments which in the preceding century had been patronised from different motives. Accordingly many tournaments were held in this reign, not so much for the purpose of exercising the knights in the use of arms, or to exhibit the prowess of the combatants, as to dazzle the eye with the splendour of their armour, the decorations of the lists, and the beauty and dresses of the ladies. It is therefore in this reign that the desire to enrich the armour with engraved work, &c. appears to have originated, although it was not until some time after the period of which we now speak that the practice was carried to any great extent.

The figure of Edward IV. in the Tower is in a complete suit of tournament armour of this period, exhibiting nearly all the changes and improvements which had taken place during the fifteenth century. These we shall proceed to enumerate, continuing our previous account, which terminated with the reign of Henry VI.

The breastplates were now made very globular, the elbow-plates were worn of a great size, and large tuilles, terminating in a sharp angle, covered the thighs. As the shoes were made with very long toes, the sollerets partook of the same form, and were called cracowes, but by a statute passed in the 3 Edward IV., they were limited to two inches. The visored salade was the prevailing headpiece, helmets being seldom worn, except at tournaments, but the skull-caps of steel, called casquetels, which had been introduced in the reign of Henry VI., were gradually acquiring popularity: these were furnished with round or oval plates over the ears, called *oreillets*, and sometimes with a spike at the top, called a *charnel*. The surcoat and jupon were seldom worn, but their place was supplied frequently by a loose tabard of arms like a herald's.

The halbert, voulge (a variety of the glaive or guisarme), and the zenetaure, or janetaire, a kind of Spanish lance, were the weapons employed at this period, in addition to those before mentioned; and to these may be added the hand-gun, in form like a small cannon, fire-arms having been introduced in the reign of Edward III. The armour of Edward IV. in the Tower has the additional pieces termed *grand-guard*, *volant-piece*, and *garde-de-bras*.

The grand-guard was a large plate of steel fastened over the left side of the breastplate, in form something like a shield, for which it was designed as a substitute.

The volant-piece was a steel plate covering the beaver or lower part of the helmet, and presenting a very sharp angle in front. It was so difficult to strike this with effect, that it often formed part of the agreement at tournaments that it should not be used. The garde-de-bras was, as its name implies, a piece designed as an additional protection for the arm: it was screwed to the elbow-pieces, and extended as low as the gauntlet.

The figure of Edward carries in its hand a long lance, having a vamplate of very peculiar form, and has the feet encased in the large stirrups of the time, which, covering the foot, did not require sollerets or steel shoes.

The crimson velvet housing of the horse is powdered with suns and white roses, the badges of the king.

The date of the armour is believed to be about 1470.

THE DRUSES.

[Concluded from No. 510.]

The residence of the emir of the Druses is about an hour's march from Deir-el-Kamr, and stands on a hill which rises in the valley like an immense natural tower, the summit or plateau of which is crowned by the palace. It consists of an extensive pile of buildings, and resembles in some respects the castle of a great feudal chieftain of the middle ages. Two thousand persons reside in and about it, scribes, soldiers, slaves, retainers, carpenters, bricklayers, blacksmiths, and other artisans. Spacious courts extend from the top to the fortifications at the base. M. de Lamartine, who visited this place during his pilgrimage in the East, gives a graphic account of its oriental character. When he visited it, the massive gate of the first court was guarded by Arabs armed with muskets and long slender swords. In one of the courts he saw five or six hundred Arab horses, many of them richly caparisoned, and fastened by the head and feet to ropes stretched across the court, and there were groups of camels within the same enclosure. In one of the interior courts young pages mounted were practising feats of horsemanship. The arrival of visitors being announced to the emir, they were conducted to apartments looking upon a handsome court adorned with arabesque pillars, with a fountain in the centre, whose

waters murmured in a marble basin. The windows were without glass, the rooms destitute of furniture; the uneven floor was composed of rude earth mixed with chopped straw, and lizards and rats had occasionally taken up their abode in the decaying walls. Presently rush mats were brought in by slaves, who spread them on the floor and covered them with damask carpets, and afterwards refreshments were served. M. de Lamartine and his friends, being summoned to the presence of the emir, were introduced to him in a splendid saloon paved with marble, and the walls and ceiling ornamented with arabesques and Arabic inscriptions. In the corners of this apartment were small fountains, and in one of the farthest recesses, in a grated enclosure, an enormous tiger was reposing. Secretaries in flowing robes, Arabs in rich attire, and negroes and mulattoes, stood before the emir, who reclined on a divan at one end of the saloon, which was raised about a foot above the other part. The visitors were shown the baths, consisting of five or six small ornamental rooms supplied by pipes with cold and tepid water, and then proceeded to the emir's stud, consisting of between two and three hundred beautiful Arabians. Some were lying in the dust in the spacious court, or were kept in check by iron rings fastened to long ropes stretched across the court, while young black slaves in scarlet vests were in attendance upon others. The evening closed with the performances of musicians, singers, and extemporaneous bards. The scenes which M. de Lamartine describes are worthy of the Arabian Nights' Entertainments, and probably they are also rather too highly coloured. But Dr. Hogg, an English physician, who visited the same place three or four years afterwards, gives an account of the emir's palace nearly as animating. Aleppo had just surrendered to Ibrahim Pasha, with whom the emir had formed an alliance, and he found the front of an extensive pile of newly-erected barracks thronged with soldiers, with their piles of arms, accoutrements, and baggage, and here and there a campfire was blazing. Swarms of attendants, soldiers, and peasants, with cumbrous equipments, banners, and martial music, gave a rich confusion to the scene. In an inner court were two hundred mountaineers in gay and varied costume, with curious embossed arms, which they were ever and anon firing off in honour of the day. The emir can collect 30,000 armed men, it is said, at a very short notice, and for a campaign a still larger number.

What is better than this barbaric magnificence is the spirit of industry which characterises the Druse population. Cotton and silk are the staple of their looms. In the towns and villages almost every family weaves cotton-cloth for domestic consumption, which is used for shirts, and, when dyed, for robes or gowns. Silk is produced, and some quantity is exported by way of Beyrout. The plains produce corn and grain, and good pasturage is found in the upper ranges of the Libanus. The industry of man does much to render the soil fruitful. Wherever a space of twenty square feet of soil is to be found, it is made to produce millet and other crops, and terraces are formed on the slopes to level the ground and prevent the earth being swept away by the rains. Here the vine and the mulberry, the fig, and various other fruit-trees are made to flourish, trenches for irrigation conducting the water from the mountain summits. Dr. Hogg, in his tour through this country, was delighted with the scenes of industry which he witnessed. We cannot help taking a glance at one or two of them:—"A well near the road was thronged with peasants of both sexes supplying water to oxen and sheep. Heaps of produce were piled round the entrance of the village. Men, women, children—all were in movement. Some were threshing and winnowing according to Eastern fashion, others housing the corn already disengaged from the straw. A clumsy machine, sometimes drawn by a horse and sometimes by two bullocks, was driven round the threshing-floor by a man, who flourished a long goad and had often children riding, highly delighted, by his side." In another place he saw "large herds of cattle quietly feeding with troops of brood camels, all guarded by Bedoween attendants, whose simple tents were little superior to a gipsey encampment." And again, when on his road to the palace of the emir—"A brilliant sunshine threw an air of cheerfulness around, cultivation and care were everywhere visible, the dissonant creak of the silk-wheel was frequently heard, and we joyfully hailed the exhilarating indications of ease and industry: the habitations, though small, exhibited an appearance of neatness and comfort."

The children of the Druses are generally good looking, with fair complexions, red lips, and black eyes. The men are handsome, well dressed, clean, and polite. Their usual dress is a coarse woollen cloak, with white stripes, thrown over a waistcoat and loose breeches of the same stuff, tied round the waist by a sash; the turban is flat at the top and swells out at the sides. The women wear a coarse blue jacket and petticoat, without any stockings; the hair plaited and hanging down in tails behind. From the period of adolescence they wear a singular head-dress called the 'tantoor.' It is a hollow tube about fifteen inches long, gradually diminishing in thickness until it terminates in the form of a truncated cone. The larger end is fixed on the forehead like a horn, and over the smaller projecting extremity the veil is thrown. The 'tantoor' worn by girls is made of stiff paper or some similar material, but on being married the bridegroom presents the bride with one of silver or silver-tinsel. Mr. Jowett was informed that females brought up at Damascus and in the cities do not wear this ornament, which he conjectures is a relic of the ancient costume of the mountains. Dr. Hogg had an opportunity of examining the 'tantoor' worn by the wife of his host:—"In length it was perhaps something more than a foot; but in shape had little resemblance to a horn, being a mere hollow tube, increasing in size from the diameter of an inch and a half at one extremity to three inches at the other, where it terminated like the mouth of a trumpet. This strange ornament, placed on a cushion, is securely fixed to the upper part of the forehead by two silk cords, which, after surrounding the head, hang behind, nearly to the ground, terminating in large tassels." The material was silver, rudely embossed with flowers, stars, and other devices; and sometimes the large tassels are capped with the same metal.

Deir-el-Kamr, the capital of the Druses, is situated in a beautiful valley on the west of Libanus, where it slopes towards the Mediterranean, and is about nine hours' march from the coast, south-east of Beyrout. It contains about 700 or 800 houses, and resembles a town of similar size in some parts of southern Europe. The houses are formed of mud, and each family occupies one or at most two rooms. The inhabitants are in easy circumstances, but are not rich. In some parts of the country of the Druses the houses are built entirely of blocks of stone without a particle of wood. Those at Deir-el-Kamr are but ill adapted to the cold and rainy season. Mr. Jowett, who was at this place, on the 8th of October, notices the approach of this season in his diary:—"In the morning of this day—not an hour too soon—the master of the house had laid in a stock of earth, which was carried up and spread evenly on the roof of the house, which is flat. The whole roof is thus formed of mere earth, laid on and rolled hard and flat. On the top of every house is a large stone roller, for the purpose of hardening and flattening this layer of rude soil, so that the rain may not penetrate." It is to grass growing on the house-top that the Psalmist alludes (*Ps.* cxxix. 6). As the windows have no glass, the lattices are closed in stormy weather, and for three months in the year the inmates often live whole days by candle-light.

LILLEBONNE.

[From a Correspondent.]

[Castle of Lillebonne.—General view of Ruins, Church, &c.]

Going from Hâvre up the Seine you pass on your left the now decayed village once known as "the riche and mightie citie of Harfleur," and thence in little more than an hour the steamer brings you in front of the Château de Tancarville, the old abode of one branch of the great family of Montmorency, the Sires de Tancarville. Here the river suddenly contracts to one half its former width, hemmed in by the projecting promontory on your right, upon the extremity of which is placed the old town of Henriqueville* or Quillebœuf. The singular situation of the town, its antique roofs and church towers, engross the attention of voyagers, and few in passing give more than a glance at the opposite shore, the wooded valley opening between the Château de Tancarville and the village of Notre Dame de Gervachon, and the distant view of the elegant spire and ruined castle of Lillebonne. But although thus passed unnoticed, Lillebonne possesses much that will repay the examination of the traveller. Its situation would be considered striking in any country, and is singularly lovely for a land so destitute of beauty as France in general. The town contains remains of Roman and baronial buildings of great interest, and Lillebonne was the scene of one of the most important events in modern history. Situated about two miles from the eastern bank of the Seine, and approached from the water side by a rugged lane, the town is seldom if ever visited by travellers from the river; and although the high road to Rouen passes through the place, the bad accommodation furnished by the small inns occasions it to be as little noticed by those who travel on land. We shall therefore preface our account with some particulars of the approach to and general appearance of the place. Coming from Hâvre the traveller descends into the valley of Lillebonne by a road winding through a hill-side coppice—what White of Selborne calls a hanger—commanding on his left a view of the wooded valley and the streamlet winding down from Le Valasse, overlooking the pleasure-grounds of a new country-house almost under his feet; as he advances, another woody vale opens before him, and, in the middle of the wider valley, formed by the junction of the two others, before him lie the clustered houses of Lillebonne, the fretted spire rising above the house tops, still higher the ruined walls and towers of the castle, and below the town the valley opening on the broad waters of the Seine, and the high grounds of the opposite shore showing upon the horizon. The scenery much resembles that in the valleys of South Devon which look upon the sea. It wants the varied outline and richly coloured soil of the Devonshire valleys, but they afford scenery that in its own kind is not equalled in Europe.

An Englishman can hardly approach the abode of William the Conqueror—the scene of the most solemn and important acts of that monarch's eventful life, without feeling, even in spite of himself, his attention quickened and his imagination somewhat excited. The writer of this sketch must acknowledge that such at least was his case when, leaving the little Hôtel des Trois Marchandes, he threaded his way under the market-house, and through the narrow streets, to the Castle of Lillebonne. It was probably this feeling that caused him to observe with peculiar interest a little square of coloured paper, containing a written notice commencing—"Terrein à fieffer," which was affixed to the door-post of a notary's office. It seemed strange to meet this phrase of the bygone feudal time, "à fieffer," under the castle walls of him who had bound the feudal system upon England. After the lapse of centuries, and countless changes, the impress of his spirit seemed yet visible under the walls of his old abode. The castle, as you approach it from the town, is surrounded by a broad enclosed piece of ground, formerly the moat, but now used as an orchard. A long wall of cut stone running down on the right is surmounted by the shrubs and trees of a raised garden within. At the corner

* Henri IV. added to the buildings of Quillebœuf, and commanded that the town should be called Henriqueville. But the royal power proved impotent to change the old well-known appellation of Quillebœuf.

next you is a small round tower, capped by a cupola-top of slatework, itself probably of no recent construction, but newer by centuries than the tower it covers. Next this is a high wall, once forming the side of the ancient living-rooms of the castle, but of which this alone remains. Having lost much of its original height, the rough ashler work at the top between the outer courses of stonework became exposed to the weather, and has recently been protected, with more care than taste, by a pent roof of slate. Adjoining this is the modern house, in which the proprietor, M. Levesque, resides; separated from which by another portion of ruin is the most remarkable remain of the old pile, a lofty circular tower at the south-eastern corner of the building. It is of considerable circumference, in perfect preservation as high as the third story, and surrounded at the base by a circular fosse, and decorated at the top by the waving grasses and shrubs that have rooted amongst the loosened stonework of the higher parts of the structure. Next this tower, on the third side, from which the sketch is taken, is a large square mass of masonry. In this is the principal gate of approach to the house. This has none of the characteristics of the approach to an ancient castle; it appears rather to have been a way pierced through the enormous thickness of the wall after the castle ceased to be used as a place of defence, and in part filled up afterwards when the archway gave signs of its inability to bear the mass above. Next the gateway is the lofty but slender remain of another tower. On this side the towers are seen for some distance mixed with trees; upon the fourth side the ground suddenly sinks to a depth of thirty feet; and at the foot of the wall runs the road to Rouen. The space within the oblong enclosure is used as garden and pleasure-ground for the house. In the view, the house and roofed wall are lost behind the circular tower. They lie between that and the cupola tower, which is seen at the farther corner. On some of the buildings are still visible the armorial bearings of the D'Harcourt family, who long possessed the property. From that family the château passed to the Princes de Croi, and was sold by them to the present possessor, M. Levesque. But, through all changes, the old castle has been ever known as Le Manoir de Guillaume le Conquerant.

In 1825 the Prince de Croi, in levelling the ground next the fosse on the west side of the castle, discovered a large collection of Roman vases, rings, medals, &c., some distance below the surface; so that it seems probable the old palace of William the Conqueror was raised on the remains of an older building erected by the Romans on the same elevated site. Few more agreeable situations could be found in the whole of his dominions than that chosen by the rough and haughty Duke William for his residence. His palace commanded a near view of secluded valleys and hanging woods, and caught a glimpse of the busy world beyond by the prospect over the current of the Seine.

On learning the death of King Edward the Confessor, and that the Saxon Harold had assumed the English crown, William summoned the principal persons of Normandy to a council in his palace at Lillebonne. In the hall of the castle were assembled, says the Chronicle of Normandy, warriors, churchmen, and merchants from all parts of the country. The duke explained to this assembly his plans for the invasion and conquest of England, and solicited their assistance. The assembly then retired to deliberate. The discussion was hotly maintained; the members of the council left their seats, separated into groups, and talked and gesticulated with great noise. William FitzOsbert, the seneschal of Normandy, proposed that they should aid the duke with ships, provisions, and money. "For," said he, "if you refuse him, and he succeeds without your help, he will remember it." "We owe the duke no aid," said the others, "to go beyond sea; he has already injured us by his wars, and if he fails in his new enterprise, our country is ruined." It was at last agreed that FitzOsbert should speak for them to the duke, and excuse the smallness of their offered aid. They returned to the duke's presence, and FitzOsbert, addressing him, declared that his faithful subjects agreed to give all he asked. "No, not so," shouted the others; the disorder recommenced, the assembly dispersed, and the members left the castle. The council of Lillebonne had apparently confounded William's schemes of conquest; there should be no attempt to enslave another people; the Anglo-Saxon nation should be left under an Anglo-Saxon king—and England should be at peace.

But William called the chiefs of the meeting separately to his presence, and entreated each as his good friend to aid him in the invasion of England. What all were bold to refuse together, each separately yielded to the personal solicitations of his sovereign. With the aid thus at length granted by the council assembled in the castle of Lillebonne, William sailed for the invasion of England. And now, after seven centuries, the consequences of that assembly at Lillebonne may be traced in the constitution, the laws, language, and manners of England.

Fourteen years after the conquest of England, William summoned another council at Lillebonne. The Norman bishops and barons alone attended this meeting; his necessities being past, William forgot the merchants. In this assembly were promulgated the collection of Norman laws known as the Statutes of Lillebonne.

[To be continued.]

SAFFRON.

The substance called saffron is obtained from the *Crocus sativus*, a perennial bulbous plant, much cultivated in some parts of Essex and Cambridgeshire, though not to so great an extent as formerly. This plant flowers in October, but in this country never produces any seeds, a sufficient proof that it is not indigenous here, as some have supposed it to be. The corolla is of a purple colour, and pleasantly scented: it has three stamens, terminated by arrow-pointed summits, and one pistil, the slender style of which rises to half the length of the petal, and is crowned with three oblong stigmata of a bright yellow colour, spreading asunder. These stigmata are the only valuable parts of the flower, and, when prepared in the manner we shall presently describe, form *saffron*.

The Arabian name of this plant is Zahafram, and the terms used for the dried product in the English, French, Dutch, German, and Russian languages, appear to have been derived from that source. The medicinal virtues of saffron were early known to the Romans; and we read of its being recommended, by the Cilician physicians who attended Antony and Cleopatra, for clearing the complexion, by relieving the liver from an excess of bile. It was likewise made use of to allay inflammation, especially that of the eyes, and was considered efficacious in the removal of coughs, pleurisy, &c. We are told by Pliny that the plants from which the best saffron was obtained grew on Mount Corycus, in Cilicia; the next in quality on Mount Olympus, in Lycia; and the third quality at Phlegra, in Macedonia. Sicily also abounded with the plant; and Sicilian saffron was much esteemed by the Romans, and used as a perfume. It was their custom to steep it in wine, and sprinkle their theatres with the infusion, so that the odour should pervade the whole of the building.

The time of the introduction of the plant into this country is not known, but it is conjectured that the Romans brought it with them; and although its multiplication here cannot be so rapid as in those countries where it is propagated both by seeds and offsets, yet the bulbs

increase considerably in number in the space of two or three years; so that to make the most of a saffron plantation, it is neeessary to take up the plants, separate their roots, and plant them afresh every three years. This being the case, it is not improbable that the plant gradually spread in the neighbourhood where it was left by the Romans, so as to have been mistaken for a native species of crocus. The earliest accounts of it make mention of its growing near a Roman road running through Essex; and in 1586 the fields about Walden, according to Camden, made a show with this plant. It is well known that the town of Saffron Walden derived its name from the early cultivation of the saffron crocus, and that it was formerly the chief market for saffron.

The following is the method pursued in the cultivation of this plant, and in the preparation of the stigmata for use. The soil chosen for a saffron-ground is a good light mould on a substratum of chalk. The land is exposed, and is at a distance from plantations, which would prevent the free passage of air. Two or three months are employed in the preparation of the ground, by manuring. and frequent ploughing. This process is completed by Midsummer, and at the beginning of July the planting begins. Small narrow trenches are dug for the reception of the bulbs, and these are placed at about three inches distance from each other. The same space only is allowed between each trench, so that a great quantity of bulbs must be provided for the saffron-ground, though it does not often exceed three acres in extent. It is said that 128 bushels of roots are required for one acre. In September the young plants begin to make their appearance, when they are carefully weeded; and in the following month the flowers appear. The owner of the plantation then collects a number of assistants, and the gathering commences early in the morning, before the flowers have expanded. The blossoms are thrown by handsful into baskets, and at eleven o'clock the work ceases, and the flowers are carried home.

They are then spread upon a table; the stigmata, with a portion of the style, are carefully picked out of the flower, and the rest is thrown away. A portable kiln of a peculiar construction is made use of for drying the stigmata, which are laid thickly between sheets of white paper, and placed on a haircloth stretched over the kiln. When the fire is lighted, a coarse blanket, five or six times doubled, is pressed down by a loaded board on the paper containing the saffron. The heat is at first strong, that the moisture of the saffron may be well exuded; and when it has lasted thus for two hours, during which time the saffron has been turned once, the temperature is reduced, and a moderate heat is kept up for twenty-four hours, the saffron being turned every half-hour. It is then fit for the market. By this process the saffron is formed into cakes; but when *hay-saffron*, as it is called, is to be made, the stigmata are dried in their separate form, and possess a finer quality. Five pounds weight of fresh saffron is required to produce one pound of dry. The first crop yields a much smaller supply than the two following ones, and at all times the produce of a saffron-ground is very precarious. Sometimes the returns are not sufficient to pay the expense of planting, hoeing, gathering, and drying.

English saffron is superior to that which is imported from other countries: the blades are much broader, and it is more carefully dried. French or Sicilian saffron comes next; but that from Spain is of a very inferior quality, badly dried, and greasy. It is said that a portion of oil is mixed with it for its better preservation. There are many ways of adulterating saffron, and considerable temptations to make use of some of them, since the price is rather considerable. The petals of marigold and of safflower are sometimes used for this purpose; and occasionally saffron from which the colouring matter has already been extracted is fraudulently mixed with the genuine. Fine sand is also sometimes added to increase the weight. The best sort of saffron, commonly sold under the name of *Crocus anglicus*, is of a rich and deep orange-red, with a small admixture of paler fibres. Its taste is slightly bitter and aromatic, and its odour strong, peculiar, and diffusive. Infusions of it should be of a bright and very deep golden-yellow colour.

The medicinal effects of saffron were highly extolled in former times, especially its power of exhilarating the spirits and removing hysterical depression. An old proverb thus alludes to one of a merry disposition:—*Dormirit in sacco croci*—"He hath slept in a bag of saffron." Gerard tells us that the "moderate use of it is good for the head, maketh the sences more quicke and lively, shaketh off heavie and drowsie sleepe, and maketh a man merrie." He also states it to be good in diseases of the lungs, and as a strengthener of the heart. Saffron was formerly worn suspended in small bags under the chins of those who were suffering from small-pox, as it was said to promote the eruption and relieve the patient. It was likewise recommended to be worn in sea-voyages, as a remedy against nausea. In Culpeper's 'Herbal' we meet with the following curious account of the virtues of saffron:—"It is an herb of the sun, and under the lion, and therefore you need not demand a reason why it strengthens the heart so exceedingly. Let not above ten grains be given at a time; for the sun, which is the foundation of light, may dazzle the eyes; and a cordial being taken in an immoderate quantity, hurts the heart instead of helping it. It quickeneth the brain, for the sun is exalted in Aries, as well as he hath his house in Leo." This astrological botany was much in favour in Culpeper's time. We may however remark that the importance of confining the use of saffron to small doses has been recommended from various quarters. Galen says that when saffron is used too freely, it either destroys the patient's reason or procures his death. Boerhaave classed saffron among the narcotic poisons. From modern practice it has been nearly rejected, as being of small medicinal efficacy and of considerable expense.

Saffron is now chiefly used as a colouring material in several tinctures, in the syrup of saffron, and in aromatic confections. It is also used in cookery, and in colouring articles of confectionary, liqueurs, and varnishes. An infusion of it is often given to moulting birds; but here also it should be used with caution, as too large a dose may prove fatal. The root of the saffron crocus is subject to a disease called by us *the rot*, by the French *la mort*. This disease, which has sometimes laid waste a whole plantation, is found to proceed from a minute parasitical plant which grows on the bulb, and draws away through its slender filamentous roots the nourishment which belongs to the crocus. The only method of stopping the progress of this disease is said to be the digging of trenches between the healthy and the infected part of the field.

THE ROOK.

[From a Correspondent.]

There is probably no other bird, in a wild state, so generally and familiarly known as the *Rook*, throughout the whole extent of our island of Great Britain; and it has long been a matter of controversy amongst those best acquainted with their general habits, namely, farmers and persons employed in agricultural affairs, whether or not rooks are useful or detrimental to the general interests of the farming community. Without any prejudice against these gentry in glossy black, I think it must be admitted that their enemies have ever been more numerous than their friends; but I am inclined to believe that a great majority of them belong to a class of persons who seldom take the trouble to trace effects to first

causes. They witness the rooks pulling up a little grain, or stealing a few potatoes; and without taking time to reflect upon any little services they may previously have performed, in a feeling of ignorant vindictiveness they exclaim, "The whole of the rascals ought to be shot!"—and declare war against them accordingly. In very severe winters they are sometimes driven to attack corn-stacks, but only extreme hunger will drive them to do this. Farmers, angry at beholding their lands pilfered of a little grain, or a few of the smaller sized potatoes (for rooks rarely attempt to fly off with large ones), totally forget how assiduous these very birds were, when the lands they now pilfer were being ploughed, in strutting along the furrows after the plough had turned up the soil—first turning their heads cunningly on one side, and then on the other, in search of grubs, worms, and insects,—letting nothing escape with life that their keen eyes could discover; all of which would, in some degree or other, have been prejudicial to the succeeding crops, and hence to the interests of the farm and the farmer. Then again, their enemies declare that rooks not only pilfer the wool from the backs of their sheep, but that they sometimes destroy lambs, and even attack full-grown sheep which happen to be weak, or such as chance to get 'east,' as it is called, that is, accidentally placed in a position with their backs lower than their feet, from which they are not able to rise without assistance, when it is asserted the rooks will tear out their eyes. Now here is a grand mistake,—one of those vulgar errors still common in many parts of the country, and mainly arising from rooks being generally termed crows. It is well known that the carrion crow will occasionally attack lambs, and tear out the eyes of sheep as above stated (magpies will do the same thing), and hence arises the vulgar prejudice against all crows; for when these people wish to make a distinction between the two sorts, rooks are called *white*-billed and the real carrion kind *black*-billed crows.

Though rooks almost invariably live in communities—sometimes larger, and sometimes smaller—there are occasions where a pair (invariably young ones, it is believed) single themselves out, and, like the cunning and solitary magpie, build their nest alone. Not unfrequently those solitary nests lay the foundation for future rookeries; for although many of the largest rookeries have existed in the places where we now find them for more than a century, in situations where they are much molested and annoyed during the building and breeding season, it is no uncommon thing to find a few of them deserting their old haunts, and selecting some other place, and there founding a new colony; and the largest colonies of rooks are necessarily broken up when the trees that have borne their nests are cut down. When rooks build in trees that have not attained their full growth, there can be no doubt but the timber is somewhat injured by them, for when building new nests, or repairing the old ones, they break off the young shoots and small branches that happen to be near at hand and suited to their purpose, by which means the growth of the timber is more or less retarded and injured.

Long and careful observation of the rooks has fully proved that parties composed of the same individual rooks daily leave the rookery together and repair to their ordinary haunts; while other parties take a contrary direction, never interfering, apparently, with each other's districts of feeding-ground. Another peculiarity is very striking, namely, that after leaving the rookery they do not take an accidental course, as it were, in their flight, but have a particular track they daily travel by, scarcely deviating to the right hand or the left, unless driven out of their course by some violent storm or tempest,—and even then, by lowering their flight, and skimming along the surface of the ground, they commonly contrive to keep within a trifling distance of their ordinary track. They frequently journey several miles before they halt at all; indeed, their morning flight often takes them to the extreme extent of their customary haunt, from whence, after resting and seaching for food, they begin to draw towards home by short and varied flights; being engaged several hours during the day in catering for a somewhat precarious subsistence. It is a rare circumstance to find two parties of rooks belonging to different rookeries feeding in the same vicinity; apparently not being disposed to encroach upon each other's haunts. Private quarrels occasionally take place among themselves, for it is quite a common occurrence to witness a couple of rooks pouncing upon each other, particularly in their evening flights towards their roosting-place. Quarrels likewise take place in the rookery during the building season; and the rapidity with which they demolish each other's nests is truly astonishing. It would seem that they have certain laws or regulations by which their colony is governed, respecting the limits, &c. to which their nests may extend. On several occasions I have watched their proceedings in this respect, and have known a few of them to assemble and attack and pull to pieces any nest that some young or foolish colonist had constructed outside the limits. I have also seen a pair of rooks persevere and rebuild their nest two or three times; but it was always in vain, for the general community seemed determined to coerce into obedience any wilful or perverse member.

That they are strongly attached to their usual haunts is very evident, for even after they have been attacked with fire-arms, day after day, and several of them killed or wounded, they will return again and again, though evidently more shy and distrustful; and should they, after cautiously examining the scene, discover no enemy near, they will then commence a search for food upon the very ground of their previous disasters. Neither do we find that they desert those rookeries where it is annually the custom to shoot the greater portion of the young rooks: a day's rook-shooting on some gentleman's domain is looked upon by many of the neighbouring farmers as a sort of set-off against any damage their crops may have sustained from the rooks during the previous season.

It is a pretty general opinion with country-people, that at whatever farm a colony of rooks establish themselves and form a rookery, it is a certain omen of prosperity and good luck to the occupier of the land, whether he be owner or only tenant; and on the contrary, that when a colony of rooks quit and desert a regularly established rookery without any apparent cause, their desertion betokens poverty and misfortune to those who reside on the premises. These opinions, of course, are founded in error, like many of a similar character that we still find prevailing in country places; they are the remnants of the superstition of past ages.

One of the largest rookeries to be met with in the north of England is that at Dallam Tower, near Milnthorp in Westmoreland, the seat of George Wilson, Esq. And what renders this large rookery peculiarly remarkable is, its close proximity to a heronry. In fact the rooks and herons both occupy the same extensive grove, their nests, however, not at all intermingling with each other. The annexed account of them was drawn up by a gentleman of undoubted veracity who resided in the vicinity,* and there can be no doubt of its general correctness, since I have heard many of the oldest of the inhabitants relate the same circumstances, individuals who lived close by during the time of the war, as they called it, between the two parties. The following is the account alluded to:—

"There were two groves at Dallam Tower adjoining to the park, one of which for many years had been resorted to by a number of herons, which there built and

* Dr. Heysham of Carlisle, published in Bewick's 'Birds,' vol. ii., p. 11.

bred. The other was one of the largest rookeries in the country. The two tribes lived together for a long time without any disputes. At length the trees occupied by the herons, consisting of some very fine old oaks, were cut down in the spring of 1775, when the young brood perished by the fall of the timber. The parent birds immediately set about preparing new habitations in order to breed again, but as the trees in the neighbourhood of their late nests were only of a late growth, and not sufficiently high to secure them from the depredations of boys, they determined to make a settlement in the rookery. The rooks made an obstinate resistance, but after a very violent contest, in the course of which many of the rooks and some of the herons their antagonists lost their lives, the herons at last succeeded in their attempt, built their nests, and brought out their young.

"The next season the same contests took place, which terminated, like the former, by the victory of the herons. Since that, peace seems to have been agreed upon between them. The rooks have relinquished that part of the wood the herons occupy. The herons confine themselves to those trees they first seized upon, and the two species live together in as much harmony as they did before the quarrel."

The above account was written many years ago, but from its date up to the present time nothing very remarkable has happened between these two colonies at Dallam Tower. The rooks occupy all that part of the grove or wood fronting the park and road leading to and past the mansion, while the herons seem perfectly contented to occupy the rear part of the grove, which is very retired and secluded, and apparently better suited to the solitary habits and views of these birds. Notwithstanding the herons are neither molested while young, nor any of them shot, as happens yearly to the young rooks, nor hunted by tame hawks and falcons, as was the case in olden times, yet the colony at Dallam Tower has scarcely varied in the number of nests during the last fifty years. This is the more remarkable, as they do not, like the rooks, occasionally commit depredations upon the farmer's crops, for which they are doomed to suffer death; since their haunts are the sedgy brooks and rivers in the silent meads, or the boggy ditches so numerous in the morasses or peat-mosses adjoining the head of the neighbouring æstuary, Morecambe Bay, near to which the heronry is situated. Formerly, indeed, they were more commonly and wantonly shot than they are now, when the use of fire-arms is more restricted than was once the case. Not that they were considered of any value, for the lower orders of the inhabitants of those parts would far sooner think of eating an old tough rook than a heron, provincially called a heron-sew.

Though rooks usually select a grove of deciduous or leaf-shedding trees in which to form a colony, they nevertheless do not object to evergreens; since at Old Hall, distant about four miles from Dallam Tower, there is a rookery of some magnitude in some rows of Scotch firs of very moderate size and elevation.

A Hint to Coffee Growers and Drinkers.—The plant which produces the Mocha coffee is the same as the West Indian; the only difference is in the mode of rearing it and the process of cultivation; but the difference in the quality of the coffee, I should think, depends chiefly on the mode of preparing the produce for the market in the West Indies. In Jamaica, when the berries become of a deep red colour, they are picked from the plant; and as the industry of the negro is estimated by the quantity he picks in a day, a good deal of unripe coffee is generally mixed with that which is fully mature. In Arabia, the produce is gathered by shaking the ripe berries from the plant, and then exposing them to the sun with the husks on till they are dried, after which the outer husk is removed, and they are again dried in the sun; but the husk is not removed till the coffee is required for the market: but in the mean time it is kept in bags on elevated platforms, to allow a free circulation of air to prevent its absorbing moisture and consequently heating. The plan in Jamaica is just the opposite to this: the husk is removed too early, and the coffee is exported too soon. Perhaps the dampness of the climate, and the difficulty of drying, arising from the suddenness of the fall of rain, may render it necessary to adopt this mode. But there is another circumstance on which the inferiority of the West India coffee may depend. Dr. Mosely observes, and I believe correctly, that "coffee berries are remarkably disposed to imbibe exhalations from other bodies, and thereby acquire an adventitious and disagreeable flavour." The exhalations from rum, sugar, and pimento, with which produce coffee is frequently exported from the West Indies, cannot fail to be injurious to a substance whose aroma is so exceedingly delicate as coffee; and perhaps housekeepers are not sufficiently aware of the necessity of keeping coffee, in substance as well as in powder, in vessels closely shut and separate from spices and other domestic stores.—*Madden's West Indies.*

The Pilgrim's Road through the Desert.—The high road to Mecca (from Cairo) was indicated by a white border of blanched bones—a strange sight, indeed, that set our curiosity on the *qui vive*. I called out to my guide, but he intercepted the question I was about to put to him, for the astonishment my very look expressed was an index to him of what was uppermost in my thoughts. "The dromedary," said he, placing himself beside me as I rode forward, "is far from being so unquiet and mettlesome a creature as the horse. He journeys onwards without halting or eating or drinking, and leaves you to discover of yourself when he is ailing, or craving food, or exhausted. The Arab, who detects the roaring of a lion, or the neighing of a horse, or the step of a man, at so inconceivable a distance, has no other key to his 'haghin's' condition than the shortness or slowness of his breathing: none has ever heard him vent a note of complaint. But when he is about to sink under exhaustion or can no longer hold up against privation, and finds life at its last ebb, the poor dromedary falls on his knees, stretches his neck out, and closes his eyes, an infallible hint to his rider that all is over with him. What is to be done? The rider, well aware that the animal never kneels down out of laziness or from disinclination to toil on, makes no attempt to get him up again, but takes off his saddle, lays it across some other dromedary's back, and leaves the creature to his fate. At night the jackal and hyæna, allured by the effluvia, hurry to the spot, and tear the wretched animal to pieces, leaving not a vestige of his carcass behind them but the bones. We are travelling along the high road from Cairo to Mecca; caravans for this last place go and come back by this route twice a year, and the bones that line it accumulate so rapidly and are replaced with such abundant regularity, as to baffle the storms of the desert, which would otherwise scatter them far and wide. They serve as a guide to the wayfarer to find his way to the wells and oases, where he may refresh in the shade and slake his thirst, and are a clue to his progress until he reaches the very tomb of the Prophet. The bones before you are not merely the bones of dromedaries who perish in the desert, for you will perceive a smaller kind of bones among them, and these are the bones of the Faithful who have set out, in obedience to the Prophet's injunctions, on their pilgrimage to Mecca, but having wasted their days on the cares and vanities of this world, and postponed their obedience until their sun was about to set, have been called hence to close their pilgrimage in heaven. Many a one has fallen asleep when he ought to have kept his eyes open; one has fallen from his saddle and broken his neck; and when you come to add to these casualties the plague, which frequently thins the caravan's ranks, and the simoom, which carries numbers off, you will have no difficulty in accounting for the preservation of a line of landmarks which show children the path which their fathers have trodden."—*Dumas and Douzat's Quinze Jours au Sinai.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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DANCING IN THE EAST.

[Arab Dance and Costume.—From De Laborde's 'Syria.']

DANCING is capable of expressing so many different feelings, that we do not wonder to find it practised among nations of every variety of character and in every state of civilization. The natives of Australia, who are in the lowest stage of humanity, find in their peculiar dance, called the "corrobora," a rude enjoyment resembling in some degree that which a dramatic entertainment affords to a more intellectual people. The dances of savage nations are also the medium by which they express defiance of their enemies or the triumph which crowns their battles with success. "The poetry of motion," for such dancing has been termed, is significant of religious feelings, of joy, love and hatred, of social harmony, and gracefulness of spirit; and next to speech it is the most ancient means by which these varied movements of the soul were displayed. Touching the connection of dancing with the ceremonies of religion, we must be careful in not drawing hasty conclusions. The editor of the 'Pictorial Bible' (vol. i., p. 667), remarks: "We must not always conclude an act to have a religious intention because it always take place in the season of a religious festival, any more than the festal observances of Easter and Christmas may be considered to form any essential part of the celebration. A festival occurs; and after attending to its prescribed observances, people fall upon their customary recreations, particularly when the festal season is of several days' duration."

Of dancing amongst the Jews the same writer gives the following account:—"Dancing seems to have been a very general recreation among the Jews—the sexes dancing apart, both in their ordinary entertainments and greater festival occasions. Dances were also sometimes performed more distinctly on a religious account. Thus Miriam and the women of Israel celebrated with music, songs, and dancing, the overthrow of the Egyptians; and thus David 'danced before the ark with all his might,' when it was conveyed to Jerusalem in triumph from the house of Obed-edom. Dancing accompanied with music was, in fact, among the Jews and other ancient nations a general mode of expressing joy and exultation, whether religious, secular, or domestic; but among some other nations it was more formally and distinctly associated with religious worship than among the Jews, whose dances did not form any part of their worship, but was an act of joy on particular occasions, some of which were religious. The distinction is important." After some further remarks the writer continues:—"In the time of our Saviour, all the elders, the members of the Sanhedrin, the rulers of the synagogues, and the doctors of the schools, and other persons deemed venerable for their age and piety, danced together in the court of the Temple, to the sound of the Temple music, every evening while the Feast of Tabernacles lasted. The balconies around the court were crowded with women, and the ground with men, as spectators." Dr. Jennings, in his 'Jewish Antiquities,' says, somewhat irreverently—"All the sport was to see these venerable fathers of the nation skip and dance, clap their hands and sing; and they who played the fool most egregiously, acquitted themselves with the most honour." The ceremony was in commemoration of David's dancing before the ark.

The connection of the mimetic dance of the ancients

with the services and most sacred mysteries of heathenism are touched upon in an erudite little work by the Rev. Robert Nares, written when a young man, and entitled 'Remarks on the Ballet of Cupid and Psyche.' The dance, he observes, being used in the service of religion, acquired a dignity which in modern times it never possessed. "Apollo, in a passage of Pindar, is called 'the Dancer;' and there is a Greek line extant which represents Jupiter himself in the very act of dancing. Even at Rome, where the dance was on the whole much less respected, the priests of Mars were, from their customary and solemn dances, denominated 'salii' (from *salio*)." Mr. Nares says that Aristotle ranked the imitative dance with the art of poetry; Plutarch considered it worthy of distinct discussion; and Lucian preferred it to the speaking drama. Mr. Nares quotes Athenæus, who says—"The Greeks had brought their dances to such perfection in the art of imitating the passions, that the most eminent sculptors thought their time not ill employed in studying and designing the attitudes of public dancers; and to this study (he adds) they owed, undoubtedly, some of the transcendent beauties of their works."

The modern ballet of the opera-houses of London, Paris, and Italy has lost the gracefulness and dignity of the ancient orchestic drama, and is now reduced to a "divertissement" without subject or connection. "Even good grouping is generally neglected; and vaulting, spinning, and distortion of limb threatening dislocation are the only exhibitions that gain any applause, and consequently the only attainments to which a performer's labours are directed."*

In Eastern countries there are considerable numbers of musicians and dancers in the towns, who acquire a livelihood by attending for hire public entertainments and occasions of rejoicing. The music is performed by men, and the dancers are females; and the guests and members of a family, instead of joining the festivity in an active manner, as with us, are simply auditors and spectators. Niebuhr, who is an excellent authority on the customs of the East, remarks in his 'Travels' that "a respectable Mohammedan who should indulge in dancing would disgrace himself in the estimation of his countrymen;" and "among the Turks and Arabs, a man of rank would think it a disgrace to learn music." M. Niebuhr and one of his companions were in the habit of occasionally amusing themselves with playing on the violin, and as it was thought they were musicians by profession, a rich merchant sent for them to his house to play for his entertainment. The invitation being declined, he came himself, when the two travellers played several airs for his gratification, and on parting he offered them each a piece of money, which was declined to his great astonishment, for the Arabs never refuse presents, "and he could not conceive what inducement any person could have to learn music, if not to gain by it."

In further illustration of our subject we again draw upon the varied stores of Eastern manners and customs contained in the 'Notes' to the 'Pictorial Bible.' In the note to v. 19, c. 12 of the Book of Judges, which relates to the stratagem adopted by the Benjamites, who, in order to obtain wives, laid in wait for the women of Shiloh on their coming to dance and enjoy themselves in a place where they were accustomed to resort on occasions of religious festivity, the author gives the following interesting information:—"The Orientals generally have no places in their towns where assemblies may be held for festivity and dancing. It is therefore customary to hold such assemblies in some pleasant places in the neighbourhood, in the gardens and plantations, or in small valleys, if there be any. This is a favourite plan of the women when they desire to enjoy themselves. There are certain occasions of annual recurrence in which the women are allowed this indulgence in the fullest extent, and thus they form large parties which go out to amuse themselves with music, dancing, and such other recreations as are common among females. The approaches to the place where they assemble are now usually guarded by eunuchs, to prevent intrusion. The different sexes never participate in each other's amusements; this was the case in the times of the Bible; for we never read of any amusement or festivity in which they mingled. The Oriental women have a great passion for suburban festivities, and have many contrivances for securing its enjoyment." Traces of this Oriental habit exist in Malta, and the right of attending festivals of this kind is usually stipulated before marriage. It is the custom at Aleppo to send the women out into the neighbouring gardens and plantations when an earthquake is apprehended; and not long since they hired an astrologer to go to the pasha to predict such an event, when they succeeded in obtaining the indulgence of a holiday; but the trick having become known through the exultation of the ladies, the astrologer lost his head.

The women have also their in-door amusements in dancing. They frequently dance before their husbands for their amusement; and they vie with each other in dancing among themselves; and this is customary both in Turkey and Arabia, as well as Syria. No males are, of course, present at these times; but a person from Tripoli, who had the account from his wife, gave M. Niebuhr some information on the latter point, which we subjoin, as the English translation of this excellent traveller is but little known:*—"If the entertainment happen to be in the house of a family of rank, fifty of the greatest beauties in the city assemble, all dressed out in great splendour. In their train they bring their handsomest slaves, who attend in a separate room to take care of the coffers containing their mistress's clothes. After the ladies have been seated for some time, and have been served with refreshments, young girls are called in to divert the company with vocal and instrumental music. The most distinguished lady in the company then rises, dances for a few minutes, and passes into the next apartment, where her slaves are in waiting to change her dress. She lays all aside, even her slippers, embroidered with gold and silver, and retains only her head-dress and bracelets, which are richly ornamented with jewels. In the meantime the rest dance, and in their turns leave the room to change their dress; and this is successively repeated, so long, that a lady will sometimes change her dress ten times in one night, and put on so many different suits, every one richer than another." Any details obtained in the manner these were collected might be true or otherwise; but of course M. Niebuhr had corroborative evidences of probability, and he mentions that the Greek women had fully adopted this Eastern style of luxury and display.

Our cut, however, taken from De Laborde's work, represents a *man* dancing. This is a rare occurrence in the East, and as the letter-press accompanying M. de Laborde's pictorial illustrations is not yet published, we despaired of obtaining any trustworthy information on a case which comparatively few even of those who have travelled in the East have met with. This difficulty, however, happening to become known to a friend intimately acquainted with Eastern countries by residence and travel, he has been kind enough to furnish the following note, without which, we must confess, it would not have been possible to have given any satisfactory information on the subject of the illustration:—"Boys and youths, disguised as women, dance, but men in their proper character very rarely. In fact, it is not generally considered a creditable accomplishment for a man. I do not know of a single authority for an Arab dance of men; but I have myself seen what seems the same dance which the cut represents.

* 'Penny Cyclopædia,' art. Ballet.

* 'Travels through Arabia,' &c., translated by R. Heron, 2 vols., Perth, 1799.

In a voyage down the Tigris, it was usual to 'lie-to' during the night, and also occasionally by day, under particular circumstances. As much of the voyage was performed by tracking, there was a considerable body of Arabs connected with the vessel. They managed to pass their evenings very pleasantly, forming a very picturesque group, in the fore part of the vessel. Sometimes one of their number, and then another (but only one at a time), danced in the midst of them. It was some time before I discovered that it was intended for a dance, the motions being rather those of an animated speaker, or of an actor, than of a dancer. There was more motion with the arms and the body than with the feet. There was no musical instrument among the men, but they beat time with their hands with much animation, slapping them together. I observed that, in the first instance, the man who danced threw over his shoulders the skin of a sheep which had recently been killed, and the flesh of which was then cooking for supper. Indeed, I have observed that Arabs are unusually merry when they have a good meal in preparation. A child in the prospect of plum-pudding is not a happier creature or cares less to disguise his felicity than the Arab who knows that a full meal of mutton or goat's flesh is before him. . . . The Arabs have also a war-dance, by which, under particular circumstances, they work themselves up into a high state of excitement before commencing an attack. I never saw this mentioned in books, but I know it to be true."

MEANS OF EXCITING SKILL IN THE USEFUL ARTS IN RURAL DISTRICTS.

In a recent Number (507) we directed attention to the advantages which had been experienced in several of our large towns by exhibitions of Mechanics' Institutes, in which works of art and natural curiosities, plans and models, and other objects of interest, were collected together for a limited period, and shown to visitors at a very moderate sum. We thought such a plan might be followed by many small towns in which Mechanics' Institutes were established; but it did not strike us at the time that an interest of a similar nature might be created in districts purely agricultural by annual competitions in the various branches of rural industry and the arts which are immediately connected with them. In the Glenkens, a retired district of the stewartry of Kirkcudbright, in Scotland, containing a rural population amounting to 4000 souls, a plan of this kind has been adopted which might with great advantage be acted upon in England. A society commenced in 1830, called the Glenkens Society, has established annual competitions amongst the young men, and the result has been to promote a scientific as well as practical knowledge of their respective pursuits. The Report of the Glenkens Society shows not only the novelty, but the success of the plan:—

"For a number of years we have had annual competitions of joiners' apprentices, assigning a two-inch mortise and tenon at right angles as the task of the junior class, and a mortise and tenon at an angle of 45 deg. for the senior class. We also instituted an annual competition of blacksmiths' apprentices in the operation of horse-shoeing. In the opinion of all the tradesmen of the country, these competitions have been productive of the greatest benefit. Such is the importance attached to them, that on three several occasions joiners' apprentices have come to them from jobs in which they were engaged, at a distance of eighteen or twenty miles; and on the suggestion of one of our most intelligent master blacksmiths, we have further instituted an annual competition in flat filing, which has proved quite as satisfactory. In fact, we believe no agricultural district of the kingdom is now supplied with better tradesmen. One of our master carpenters has been contractor for various works of considerable extent, and given perfect satisfaction to his employers; and some of our young men have gone to Manchester, and even there have been considered excellent workmen.

"The prizes given by us to both classes of joiners, and also to the class of blacksmiths for flat filing, have always consisted of works on mechanics, requiring a considerable knowledge of mathematics in order to be read with profit. Our tradesmen were, in general, quite unacquainted with this branch of study when our competitions commenced; but, since that period, they have given themselves to mathematical studies in private, with such energy, that our books are now perused by them with much interest; no doubtful proof, we humbly apprehend, of the excellence of the foundation which has been laid at school.

"We have had an annual ploughing-match, which has been attended by about thirty ploughs. The whole population have turned out on these occasions, and given proof of the estimation in which these contests are held by liberal contributions, which have been increasing every year. They have had the same effect with us as everywhere else. The display of implements, harness, and cattle has been alike creditable to the district, and we are informed by judges that there is a visible improvement in the cultivation of the land. One circumstance we must notice as showing the proficiency which may be produced by these means at a very early age. Two years ago, our fourth prize was won by a lad little more than fourteen years of age; and this year, at the age of little more than sixteen, the same young man has proved himself the best ploughman in a field of thirty-two.

"We have also had competitions in spade-work and dyke-building,* and the awards in both gave perfect satisfaction. But our dyke-builders are much spread over the country, and our premiums have hardly been of sufficient amount to collect them."

Canal Weigh-Lock.—The object of the greatest interest to me in Utica was a weigh-lock, an American invention, if I am not mistaken. The toll for freight on the canal is proportionate to weight. To arrive at the weight of a cargo, gauges are commonly used: this is the process of weighing, for instance, in England: another means is used here. A steelyard on a gigantic scale is constructed; the scale, formed in a manner that the bottom of a vessel fits conveniently in it, hangs by three pairs of iron rods on a strong iron beam, which rests and plays on three nice points of steel. To this large iron beam another is fastened perpendicularly in a horizontal plane, forming the arm from which the scale destined for the weights depends. The whole is so balanced, that one pound in this latter scale balances one hundred pounds in the large scale: and, with such a degree of nicety is the whole machinery made, that quarter pounds are used as weights, which of course counterbalance twenty-five pounds in the large scale. This hangs down into a small basin communicating with the canal, with which it can be disconnected by a lock. Whenever a boat is to be weighed, the lock is opened, and the vessel floats into the basin between the iron rods of the scale, which is now under its bottom. The lock is closed, and by another lock the water is discharged from the basin, so that within a short time the whole boat hangs dry in the scale. Weights are now placed in the weighing scale; the original burden of the boat, the testimony of which every boatman carries with him, is deducted from the gross weight, and the toll is paid accordingly. The weight of the boat and cargo on which I saw the operation performed was sixty-two tons, or 136,000 pounds: much heavier cargoes, however, are weighed. When the whole was balanced, I was able literally to move by my little finger 136,000 pounds up and down. When the lock has admitted again a sufficient quantity of water, and the boat is once more set afloat, the first lock is opened, and the boat floats out. The operation of weighing, which I witnessed, lasted, from the time the boat entered the lock to its sailing out again, nine minutes; but three or four minutes must be deducted, as the weigh-master had to fetch a lantern, it having grown dark. He assured me that when the people on board the boat understood the details of the whole operation, and no unnecessary delay takes place, he can weigh any boat in less than four minutes. I could not learn the name of the author of this invention, the more interesting as it is the bold application of a simple principle known to every one.—*Francis Lieber's Stranger in America.*

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* Stone fences are called dykes in Scotland and some parts of the north of England.

LILLEBONNE.

[Concluded from No. 511.]

[Remains of the Roman Amphitheatre at Lillebonne.]

In the commencement of this sketch we mentioned that Lillebonne abounded in Roman antiquities. Many statues, medals, &c., dug up on this spot, are now deposited in the museums of Rouen and Paris. There are some remains of baths, and on an height to the south of the castle, commanding all the three valleys, is a Roman encampment in perfect preservation. Below the castle, on the side towards the Seine, and close by the road to Rouen, are the remains of a Roman circus.* An inclined road made of the rubbish and ruins of the old building, leads down from the highway into the arena, the level of which appears clearly marked by some pavement in one of the ancient entrances of the circus. The shape of the ruin is nearly semicircular; three tiers of seats rise one above another, and above the highest of the three the wall rises for a few feet in broken masses. On each side of the circus is an opening leading into a kind of side chamber, which appears to have been roofed, but has no outlet except that into the arena. This curious remain was entirely overgrown with wood; but a few years since the government purchased the wood, cut it down, and excavated the ground so as to expose the ruin to view.

Lillebonne was the capital of the ancient Caletes, who inhabited the modern Pays de Caux. After the conquest of Gaul by the Romans, Lillebonne became a place of importance, under the name of Julia Bona, or Juliobona, whence its modern name Lillebonne appears to be derived. Six Roman roads met at Julia Bona: 1st, from Rouen; 2nd, from the Roman Caracotinum, near the modern town of Harfleur; 3rd, from Boulogne; 4th, from the Roman Breviodurum, now Pont Audemer, on the other side of the Seine; 5th, from Evreux; 6th, a Roman road to the seaside, near the modern town of Fecamp. The Caletian capital, the Roman station of Julia Bona, the favourite ducal residence, has long since sunk into insignificance. Lillebonne is now a little village: its close streets have recently been thronged by the workmen of the manufactories (of Prussian blue and printed cottons) that have just sprung up on the banks of the little Rivière de Bolbec, which flows by the town. And such is the want of all communication by land or water from Lillebonne to the Seine, that English coal passes in front of the town up the Seine, is landed twenty or thirty miles higher up the stream, and brought back again by land-carriage for the use of the manufactories at Lillebonne.

In addition, therefore, to the more immediate interest which the remains of the ancient residence of William the Conqueror are calculated to inspire, Lillebonne is connected with ages yet more remote. The pageantry of these two thousand years, if it could pass before the traveller who visits this place, would disclose to him scenes which would teach him how fugitive are things which once seemed impressed with the seal of immutability. The thick forests which witnessed the rites of the Druids have disappeared ages ago, and only now and then the ploughshare brings to light a relic of the Roman city or the broken spur of a knight of the middle ages. The reflections which such occurrences suggest are apt to become vague, and we shall therefore endeavour to give a brief sketch of the Roman period in the history of this portion of France, which formed part of the Gallia or Gaul of ancient history.

Little was known of this part of Europe until the time of Cæsar, who found it principally occupied by three races —the Belgæ, who inhabited the north and north-east; the Celts, living in the west, the centre, and the south; and the Aquitani, who dwelt in the south-western parts. The Celts were probably the most ancient inhabitants, and it is believed that they settled in the country about 600 B.C. To this country the Romans turned their conquering arms, and so early as 104 B.C. their armies were signally defeated. Julius Cæsar, however, reduced the whole coun-

* The French antiquaries, who have better opportunities of examining this ruin than any passing traveller can have, declare that this building was a circus.

try about fifty years before the commencement of the Christian æra, and thus made himself more or less master of the territory comprised between the Pyrenees, the Alps, the Rhine, and the ocean. Augustus, his successor, divided it into separate parts according to its physical geography and the natural distinctions of the inhabitants. The district in which Lillebonne is situated was in Belgica, which extended from the Seine to the Rhine.

The Roman sway, though firm, was tolerant in spirit, and the countries subjected to it usually became prosperous; but in Gaul the power of the Druid priesthood was so directly inimical to the Roman domination, that, as Gibbon remarks, "under the specious pretext of abolishing human sacrifices, the emperors Tiberius and Claudius suppressed the dangerous power of the Druids, next the priests themselves; their gods and their altars subsisted in peaceful obscurity till the final destruction of paganism." But industry was not oppressed by the greedy, ignorant, and short-sighted rapacity which has distinguished less enlightened conquerors, and cities sprung up in Gaul which rivalled those of Italy. Marseilles, Arles, Nismes, Toulouse, Lyon, Bordeaux, and some others might, according to Gibbon, so far imitated the elegance and wealth of Italy as to sustain an equal comparison with the state of these places at the time he wrote his famous history. The chief Roman cities of Belgica were Trêves, Metz, Verdun, Beauvais, Amiens, Boulogne, Arras, St. Quentin, Soissons, Senlis, Rheims, Chalons, Strasburg, Mayence, Leyden, Cologne. The total number of cities which Gaul could boast of is said to have been twelve hundred, but the number is probably exaggerated, and some of these cities, particularly in the northern parts, not even excepting Paris, were "little more than the rude and imperfect townships of a rising people."* Some of them, as already observed, soon became adorned and embellished with public buildings, temples, theatres, and baths.

It was also a part of the Roman policy to construct roads in the countries which they subjugated. These facilitated the march of the legions, and enabled them to concentrate their forces with great rapidity upon any point on which their power was threatened. From the forum of Rome roads commenced which, traversing Italy, penetrated the most distant provinces, and only terminated at the extremities of the empire. An embankment formed for laying down a railway, if it were wider and paved with stone, would resemble one of these roads, which were constructed in the most careful manner, of substantial materials, and in the neighbourhood of the capital were paved with granite. They connected one city with another and all with Rome, and ran in a direct line from one place to another, the distances between each being marked by mile-stones. Mountains and rivers were no impediments, for the former were cut through and bridges were thrown across the latter. These roads were traversed by couriers on public business as regularly and with as much despatch as the post in many parts of Europe in the present day. Relays were always provided at houses erected five or six miles from each other, at which forty horses were obliged to be constantly kept; and thus, from the wall of Antoninus in the north of Britain, to Rome, and from thence to Jerusalem, a distance altogether of 3740 English miles, it was easy to travel at the rate of one hundred miles a day.

But it was not in creating merely the skeleton of a system of civilization that the Romans benefited Gaul. They introduced the vine into the southern provinces; and though in the time of Strabo the cold of the northern provinces was so intense that it was considered the grape would not ripen, yet this was not long considered an obstacle. The olive was in like manner transplanted into Gaul, and the cultivation of flax was introduced from Egypt. For several centuries the arts of Rome continued to civilise and benefit the inhabitants; and the decline of the Roman power was the commencement of a period of oppression, terror, and degradation.

* Gibbon.

In the third century the Roman empire was assailed on every side, by the Franks, the Alemanni, the Goths, and the Persians. Gaul, menaced by the Franks, a confederacy of the inhabitants of the Lower Rhine and the Weser, was successfully defended by Posthumus, who acquired the title of the 'Saviour of Gaul.' In the reign of Caracalla, who died in 217, the Suevi appeared on the banks of the Maine and in the neighbourhood of the Roman provinces, "in quest either of food, or plunder, or glory."* They came from Upper Saxony, beyond the Elbe, and their name and valour were familiarly known in all the interior countries of Germany from the Oder to the Vistula. Their army being composed of many tribes, the confederacy assumed the name of Alemanni. Caracalla encountered these hordes, and after much blood had been shed, he purchased a peace with money, a policy which in course of time proved fatally disastrous. The emperor Gallienus, who died in 268, was more fortunate, and defeated the Alemanni in a great battle near Milan. The alliance which he formed with the daughter of one of their chiefs or kings, the citizens of Rome were still sufficiently haughty to treat with scorn. After the death of the emperor Aurelian in 274, Gaul was for some time ravaged with impunity by the barbarians; but the impending catastrophe was again averted by a deliverer, Probus, who, in 277, successively defeated the Franks, who came from the flat maritime country between the Rhine and the Elbe; the Burgundians, who had wandered in quest of plunder from the Oder to the Seine; and the Lygians, a people from the frontiers of Poland and Silesia. Probus carried the calamities of war into the countries of these various tribes from the Neckar to the Elbe. But the ravages of the barbarians and the civil dissensions of the empire were rapidly hastening the ruin of one of its finest provinces, and only one crowning event seemed necessary to complete its fate. During the fourth century the power of the Romans was still sufficient to keep the Alemanni, the Franks, and other people, from settling in Gaul; but in the following century the crisis of Roman power arrived, and Italy was invaded by the Goths.

A few words are necessary respecting this people, who broke the dominion of Rome, sacked the capital of the world, and afterwards established themselves in the fairest portions of Europe—Gaul, Spain, and Italy. They are said to have emigrated originally from Asia, and fixed themselves in Scandinavia, but had wandered from that peninsula and spread themselves along the Vistula, the Oder, and the coasts of Pomerania and Mecklenburgh. A second time they emigrated, wandering towards the Euxine, following the course of the rivers, where they found water and pasturage for their herds. Towards the close of the fourth century they had become the most formidable enemies of the Roman empire, and since the middle of the third century they had frequently assailed its power. In 403 they at length invaded Italy; in 409 a host of barbarians crossed the Rhine, who never repassed that frontier stream. They destroyed many cities and ravaged the open country, and, with the exception of Armorica (the present Bretagne), Gaul lost its independence. In 410 the Goths were again in Italy, and this time they pillaged Rome. In 419 these victorious tribes settled, by treaty, between the Garonne and the Loire, and Toulouse became the seat of their authority. About the same time the Burgundians and the Franks also obtained a permanent seat in Gaul. The most fertile lands were assigned to them and divided with the antient possessors, on whom, Gibbon says, a ransom was imposed. The Empire of the West was now rapidly falling to pieces. In 435 the Goths besieged Narbonne, the southern province of Gaul, and the Belgic or northern provinces were invaded by the Burgundians.

* Gibbon

Hostilities took place from time to time between the Roman troops and the newly-settled people in Gaul; but in 451 the invasion of Gaul, by Attila, king of the Huns, united all parties, and Attila was defeated with immense slaughter at Chalons-sur-Marne, and obliged to evacuate the country.

The next page in the history of Gaul exhibits the predominance of the Franks. Forming originally a confederacy of German people, each tribe maintaining its own independence and electing its own king, they were for some time in alliance with the Empire, and their subdivision into tribes did not render their power formidable. The right bank of the Rhine was their original territory, but by treaty or conquest they had also established themselves on the left bank of the Scheldt and the Meuse. Towards the close of the fifth century, Clovis, who had been elected king of one of the Frankish tribes, commenced his victorious career, and in time extended his empire from the Lower Rhine, the cradle of his power, to the Loire, the Rhone, and the ocean. He was the real founder of the French monarchy, and died in 511. After his death this territory was dismembered, and each of the four sons of Clovis had a share; and still further subdivisions subsequently took place, until Pepin, who reigned from 752 to 762, reunited the empire of Clovis; and his son Charlemagne established it more firmly between the years 768 and 814. But the Frankish empire was not retained longer than the life of Louis-le-Debonnaire, son of Charlemagne, who died in 840. A period of inconceivable misery next ensued. Divisions and subdivisions of territory were made by various parties, and war and rapine rendered France an easy prey to the Northmen, or Normans, who in 911 acquired a portion of the country since known as Normandy. The establishment of the Normans in France brings this part of our sketch to a close, as our notice of Lillebonne in the last number began at this period.

ON THE USE OF PROPER NAMES IN ENGLAND.

[From the 'Penny Cyclopædia.']

Proper names are words by which single objects are denoted, as countries, rivers, towns, men, &c.

But when we speak of proper names, we mean, more usually, the names of men; and on this subject, to which little attention has hitherto been paid, and especially such proper names as appear among ourselves, it is our intention to offer a few observations.

In the primitive state of society, as soon as men were so far advanced as to find the convenience of having a verbal denotation of the individuals who composed a tribe, the rule would undoubtedly be, "one man, one word:" we see this to be the case in the uncivilised tribes; and as man is presented to us in very early historic periods, we still see the same system prevailing. In the Hebrew genealogies, which ascend much higher than any which possess the slightest claim to our respect in any other nation, we find a single word, as *Terah*, *Abraham*, *Reuben*, *Aaron*, *David*, *Solomon*, the only designation of the persons whom those words call up before us; and if in any instance there is any deviation from the rule, it is for some special reason, and we see it to be an exception to what was the usual practice.

In the other nations, the fathers of European civilization, it was the same, Egypt, Syria, Persia, and Greece; one person, one word: and so in the earliest periods to which we can ascend in the history of the Latin nation, we have rarely more than one word to denote one individual, or if there is a second word employed, it bespeaks an origin in something which is apart from the simple, colloquial, and usual designation of him.

In the Celtic and German nations it appears to have been the same; *Arminius*, *Ariovistus*, and the like; and in Britain, *Caractacus*. The Saxons were a nation in whom this, the primitive system, was still prevalent, not only when they first established a colony in Britain, but during the whole period when the descendants of Hengist held the supreme authority in this island. Persons do, to be sure, present themselves in the pages of historians with such additions as *Harefoot*, *Ironside*, but it may be reasonably doubted whether these terms can be properly regarded as *names*, and if it is admitted that they may be such, still these are only exceptions, the great mass of the Saxon population, of whatever rank, having but one single word by which the individual was denoted, such as *Edwin*, *Alfred*. *Gurth*, *Ulf*, *Tosti*, *Harold*, and the like.

As nations advanced in refinement, the names of the individuals comprising them became more complex. Amongst the Romans, for instance, we have *Publius Cornelius Scipio Africanus*, *Caius Julius Cæsar*, *Publius Ovidius Naso;* and names of this class formed the rule, at least in families which were free. The slaves, probably, remained with the single word only.

We have not room to enter into an examination of the principle on which this new form of personal denomination was constructed. A uniform principle, like that very valuable one on which our own personal nomenclature is at present constructed, perhaps did not exist, so that our present system is rather to be regarded as the invention of modern nations, than as borrowed by them from any of the nations of more ancient civilization.

The principle of the modern system of personal nomenclature in our own nation is this: to have one name for the individual, joined to a second name, which is common to some particular stirps (or stem) in the great English family to which he belongs. We call the two the *name* and the *surname*. We think in these days much more of the latter than of the former. But in the more solemn acts of our lives we find the proper consequence given to that which is indeed the name; in baptism, in elementary Christian instruction, at marriage, when the name is the thing in question, it is that which is properly the name, and not the surname, which is pronounced; *John*, *Richard*, *Anne*. We may find in books, even down to the close of the seventeenth century, that catalogues and indexes are sometimes so constructed, that the names, and not the surnames, are ranged in alphabetical order. Philips's 'Theatrum Poetarum' presents a late instance.

The value of this principle lies here: that it is a simple and easy mode of showing, to some extent, to what family an individual belongs; it promotes family union; but its chief advantage lies in the facilities which it affords for conducting inquiries into the condition of the ancestors of persons who may feel any curiosity on the subject, which, without the indications afforded by identity of surname, could be attended with very little success, when it was attempted to descend beyond the recollections of persons still living.

This mode of designation, we believe, prevails in most other countries of modern Europe. In England it is almost the universal plan. The royal house of England forms an exception, an unchangeable surname having never been adopted by them. In this respect the house of Brunswick is like the houses of Saxe, Nassau, Bourbon, Orleans, and a few others, springing from the persons who were of prime note in that state of society when the rule was, "one person, one word," and being afterwards too conspicuous by rank and station to need any such ordinary mode of distinction as that which the adoption of an invariable addition to the name would have given them. This was once not peculiar to the royal house of England in this island (the Stuarts, it may be observed, and perhaps the Tudors, but not the Plantagenets, were a temporary exception, being families of inferior rank, who were raised by circumstances to the possession of the regal dignity), for the earls, in the first

two or three centuries, seem also to have disdained a practice which assimilated them too nearly to the classes next below them. Thus the persons distinguished in Domesday Book as *Comites*, are *Comes Hugo*, *Comes Rogerus;* and never, we believe, with names of addition which descended to their posterity. But all these great houses have become long ago extinct.

There is also an exception to the modern rule, of another kind. There are still some remote and rudely-cultivated districts in which the inhabitants are better known by some *by-name*, as of the house in which they live, or as the son of some person well known, than by any unvarying addition to their name properly so called. This is said still (or at least very lately) to be the case in some parts of Yorkshire and Lancashire, and is certainly the case in some parts of Wales; but it is probable that the extension of education will bring all parts of this island into subjugation to a plan which has such obvious convenience.

If it is inquired when the system on which we now proceed was first adopted, the fact which has just been stated, that even now the system is not universally prevalent, will show, what is indeed the fact, that, like many other things, it has made its way by degrees. There is not, we believe, a single instance before the Conquest of persons in genealogical succession bearing the same surname; and it is also quite certain that in the mass of the population of England after the Conquest, the descendants of the Saxon population, there can rarely, if ever, be shown an instance of successive individuals of the same family being distinguished by the same surname in the two centuries immediately succeeding the Conquest. We have, indeed, but imperfect means of pursuing the inquiry for those two centuries. The names of the people of those centuries lie buried in unprinted records and chartularies. But if there are exceptions, and Saxon families in these centuries to be traced using an invariable as well as a variable name, it is in that remarkable class, who still exist in no very small number, who have one of the old Saxon appellatives in the place of the surname, such as *Thorold*, *Swaine*, *Aldred*, *Thoroughgood* (Turgot), *Godwin*, and the like.

But we find in Domesday Book that several of the Normans and other people from the Continent, who became settled in England at the Conquest, and soon after that event, are distinguished by names of addition, which are not merely personal, but names which were borne by themselves and their posterity after them. Such are *Darcy*, *Arundel*, *Devereux*, *Balliol*, *Burun*, *Laci*, *Perci*, and others, people just below the rank of the comites, and who, gaining great possessions and great power, were afterwards very conspicuous in English history. These are the persons, we conceive, who first set the example of the practice which has since become all but universal among us.

The disposition which always more or less exists to imitate what is done by a superior, is probably the principle to which we are to refer the change in this point which we find to have taken place by the middle of the fourteenth century.

By that time the present system may be said to have been pretty generally established in all the well-settled portions of the island. The statute of additions of the 1st Henry V., by requiring that the name and description of the party should be exactly set forth in any writ or indenture, would do something to consolidate the system: and when it was required that in all parishes a register should be kept of baptisms, marriages, and burials, which was one of the acts of the Reformers, there was a new check presented to any attempts at relaxation in the practice.

But even at the beginning of the fifteenth century there was much that was unsettled in the personal nomenclature of England, even in families to whom pertained portions of the soil. Thus in 1406 a person describes himself as *Willielmus filius Adæ Emmotson*, who in 1416 is *Willielmus Emmotson;* and more remarkably about the same time, a person who is described as *Johannes filius Willielmi filii Johannis de Hunshelf* appears soon after as *Johannes Wilson*. About the same time we had *Willielmus Johnson Wilkinson*, *Willielmus Adamson Magotson*, and *Thomas Henson Magot*, showing the present system then in its rudiments.

As the system at present existing made its way by degrees, and with much of casualty, so there seems to have been much also of accident in respect of the name of addition which marked the distinction of the stirpes. There are some of the surnames in common use among us for the adoption of which it is difficult now to assign any satisfactory reason. This is partly to be attributed to the corruption which many names have undergone, and partly to the strange additions which we find in the place of surnames in early documents of undoubted authenticity. One of these is *Adam that God made*, whose addition, if he lived at the period when his race first began to conform themselves to the system, would appear now in some form which would probably foil the sagacity of the most skilful inquirer. Sometimes there is a difficulty arising out of a wrong apprehension of the origin. Thus we have the names *Spring*, *Summer*, *Winter;* there is no *Autumn*. It is difficult to conceive how the names of the seasons should become the names of families; but in fact it is not so, *Spring* being a word denoting a small grove of trees, so that the name classes with *Wood*, *Holt*, and others concerning which there is no difficulty; while *Summer* and *Winter* are *Summoner* and *Vintner*, names derived from occupations.

But the great mass of our surnames may be easily explained. We cannot enter here at large into the subject; but it may be useful to those who are inclined to prosecute it, to say that nearly the whole of them may be referred to one of the five following classes:—

1. Foreign names brought in by settlers from other countries, including the Scotch and Irish names. These designate a very large section of the whole population; and there is a constant accession being made to them by the tide of population setting towards England. Very few of the names of this class introduced in the early periods remain; the great majority being of families who have become settled in England in the course of the last century and a half.

2. Names of locality.—These are divisible into two great portions: those which are derived from places of generic names only, such as *Hill*, *Dale*, *Cliff*, *Slack*, *Combe*, *Grove*, *Shaw*, *Frith*, and many others, mostly monosyllabic, which would originally appear as *John de la Hill*, &c.; and those which are derived from some specific place, as *Atherton*, *Burton*, *Denby*, and thousands of others, there being scarcely a town, village, or hamlet which has not given its name to some English family.

3. Names of occupation.—Of this class the number is very great. We have *Brewer*, *Barber*, *Smith*, *Mason*, in short every trade and every other occupation in which men engage. Lost trades, or trades which have changed their names, are preserved in the names of families whose ancestor was engaged in them at the time when his family fell into the system. Thus we have *Fletcher*, *Girdler*, *Furbisher*, *Stringfellow*, *Lister*, *Walker*, *Pargiter*, *Webster*, *Taverner*, and the like. We have also *Palliser*, *Lander*, *Foster*, *Palfreyman*, *Page*, *Woodruffe*, *Reeve*, *Hunter*, which were evidently at the beginning names of occupation. It is difficult to account for such names as *Bishop*, *Baron*, *Earl*, *Lord*, *Priest*, *King*.

4. A large portion of our personal nomenclature is made up of surnames which are formed upon those which we call Christian names. Nearly all these appeared originally in the form of *Filius*, &c, as John son of William. This mode of designation has taken various

forms. Thus on this name of *William* there are founded *Williams*, *Williamson*, *Wills*, *Wilson*, *Wilks*, *Wilkins*, *Wilkinson*, *Willis*, *Willison*, *Bill*, *Bilson*, *Willet*, *Willimot*, *Willmot*, *Till*, *Tilly*, *Tillot*, *Tilson*, *Tillotson*, *Willy*, each of which, if written by a scribe of the middle ages in Latin, would be expressed by the same phrase, *Filius Willielmi*. Other names have an equally numerous progeny. To this class may be referred *Ives* and *Iveson*, which are *Filius Judei*; *Clarkson*, *Cookson*, *Wrightson*, which are names formed not indeed on the name, but the profession of the parents.

It would, however, be to extend this article to an inordinate length, even to touch upon the subordinate classes to the five great classes.

5. The fifth and last is that of names which indicate something peculiar in the personal appearance or mental qualities of the person to whom they are first given. Such are *Swift*, *Long*, *White*, *Black*, *Crump*, *Rouse*, *Wise*, *Good*, &c.

Of the proportions in which names of the five classes enter into the composition of English society, some idea may be formed by the following analysis of 896 names, found in what was called the 'Fashionable' class of the inhabitants of Bath. Throwing out 162 as of uncertain origin, there remained 734 surnames, which give the following results:—

1. Foreign names, 142.
2. Names of locality. Generic, 57; specific, 249. Total, 306.
3. Names of occupation, 79.
4. Patronymical, 172, of which 43 were Saxon names.
5. Descriptive, 35.

The results would be somewhat different in a population of a different kind. There are six families who have names of occupation in the English peerage. The number of the individuals bearing the names varies greatly in the five classes. The ratio of the number of persons bearing the name to the name itself is the lowest in the first and second classes.

The nations who contributed the 142 foreign names were these:—

Scots,	44	German,	9	Italian,	2	Poles,	1
French,	39	Dutch,	6	Portuguese,	2		
Irish,	32	Welsh,	5	Cornish,	2		

Thus much for the *surname*.

The *names* of the ancient Saxon population of England were nearly all descriptive of some quality of mind or body. Thus *Edward* is truth-keeper; *Winfred*, win-peace; *Alfred*, all-peace; *Edmund*, truth-mouth; *Ailwin*, of all beloved; *Ulf*, wolf. But a great change took place soon after the Conquest. We see in the names of the Normans who became settled in England many which continued for ages favourite names of the English nation; *Roger*, *Ralph*, *Hugh*, *Humphrey*, *Geffrey*, *Gilbert*. To them also we owe the introduction amongst us of names of religion. If these names existed at all in England before the Conquest, they were exceedingly rare. In the catalogues of Saxon bishops not one occurs. Even amongst the first race of Normans they did not abound. We find *Adam*, *John*, *Stephen*, *David*, *Peter*, *Matthew*, and perhaps a few others. But in the century and a half after that event names of this class began to prevail in a great degree. It was a period of extraordinary Christian devotion: the exertions in founding monasteries, building churches, and maintaining the war against the infidels show it. In this state of the public mind the new system of taking names of religion spread and strengthened. The names of religion were almost wholly from the Old and New Testament, a few only being taken from the names of persons who have been eminent in later times for their Christian virtues.

Since then little change has taken place. A few names once common have lost their popularity; a few others have been introduced. There have been periods when names somewhat fantastic have had a popularity; such as the names of the virtues, as *Patience*, *Truth*, *Prudence*, *Faith*, by which women have been named; *Thankful*, *Faithful*, *Sabbath*, and others more extraordinary, have been given to men. Some went for a time into another extreme, and we had *Hannibal*, *Scipio*, *Cæsar*, and *Hercules*.

We have, however, not been sufficiently attentive to the importance of keeping up a stock of what we call Christian names. Our population has increased to a very great extent, while our surnames have rather diminished than the contrary. We should, therefore, if we wish that names should be what they are intended to be, *Notamina*, increase the number of those names out of which we have the power ourselves of selection. As it is, with a population of 20 or 30 millions, we have but 53 names of men which can be used without some appearance of singularity. Of these, 12 are in more frequent use than the rest:—

John William Henry George James Robert
Thomas Francis Charles Edward Richard Samuel

Of these, 4 are names of religion; 4 are names introduced at the Conquest; 3 names introduced at a later period from the nomenclature of other countries; 1 is pure Saxon. Of the 41 names of secondary frequency, 28 are names of religion; so that of the 53 names of men in ordinary use, 32 are names of religion, or considerably more than one-half, and they are all taken from the Scriptures.

Again, looking at the 53 names in respect of the languages from which they are derived, it appears that

25 are of Hebrew origin,
19 from the various dialects of Western Europe,
5 from the Greek, and
4 from the Latin.

There are a multitude of names, once in use in England, which might easily be revived, and it would be a matter of some public convenience to do so. Few persons have not found inconvenience in some form or other from the want of sufficient distinctness in the name he bears. Thus a little time ago there were two antiquarian Chalmers; two Parkes upon the bench; two Whitakers, both clergymen, and both writers on Lancashire topography: some time ago there were two Dr. John Thomas's, both chaplains to the king, and both bishops; and two Dr. Grays, both divines, both writers in their own profession, both connected with historic literature and poetry, and both engaged in controversies with Warburton. This occasions confusion. To change a surname is a difficult and expensive process; the cheapest and simplest remedy is to give a name at baptism which will be marked and remembered, as *Basil Hall*. Of neglected names there are, *Austin*, *Allan*, *Aubrey*, *Arnold*, *Baldwin*, *Blase*, *Barnard*, *Fabian*, *Ferdinand*, *Josceline*, *Miles*, *Sylvester*, *Theobald*, *Theodore*, and a host of others. But it might be worth the consideration of government, whether some facilities should not be afforded for increasing our very scanty stock of surnames, by the revival of many which are now extinct and lost, in persons who descend from those who bore them.

Truth.—Truth is always consistent with itself, and needs nothing to help it out. It is always near at hand, and sits upon our lips, and is ready to drop out before we are aware; whereas a lie is troublesome, and sets a man's invention upon the rack; and one trick needs a great many more to make it good.—*Tillotson.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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BRITISH AGRICULTURE.

MARCH.

[The Central Compartment taken from Cotton MS., Tiberius, B. v.; the others from Cotton MS., Nero, D. iv.; and the ornaments from various Saxon Calendars.]

In treating this subject popularly, as we proposed doing at the commencement of our present series of agricultural articles, we would wish our readers to bear in mind, that when we have occasion to speak of the state of agriculture at any particular period, during the present as well as the previous centuries, that our observations must be understood as applying in a general sense, unless they are otherwise expressed. It appears obvious that our readers should clearly comprehend this, because the 'Penny Magazine' finds its way into districts of country where few innovations upon old modes and customs, in matters appertaining to farming affairs, have yet been tolerated. Moreover, persons who happen to be novices in agriculture, in travelling through such parts of the country as our general remarks do not apply to, might naturally enough conclude that there was something at least anomalous in our account of the present state of agriculture, drawing conclusions from what actually appeared to be the case in one or more insignificant localities, without being aware that these were exceptions from the existing state of things, taken in a general sense, throughout the whole kingdom. But, admitting that we possessed the power of presenting our readers with the precise state to which agriculture has attained up to the present period, not only in each county in our island, but also in every local and isolated district—to introduce the merest epitome of the state of farming affairs would exceed beyond measure the limits we purpose devoting to this interesting subject. By way of illustration we will observe, that in our supplemental number for last month we introduced some remarks upon the state to which agriculture had attained during the sixteenth century, and there stated that "the rotation of crops usually followed during this period indicated but little advancement in the art of agriculture." Now, were this not taken in a general sense, the observation would not be an apposite one, because we are aware that even at the present day there are local districts where the very same rotation of crops that called forth the remark, bad as it certainly is, would be an improvement upon the management (or rather mismanagement) of lands in those districts, since it is no uncommon sight to witness the dale-farmers in the north and north-west of England breaking up a green sward, in the middle or some other quarter of a meadow, about the close of this month, or the beginning of April, and sowing it with oats upon the grass furrow, at the rate of from seven or eight bushels of seed per acre; and if in harvest-time the ground returns a three-fold crop, the farmer appears quite satisfied. About the same period the following spring the same piece of ground receives another single ploughing,

when something near the like quantity of corn is again expected. The third, and, probably, the fourth year, it is managed in precisely the same way, and indeed for a longer period if the grass and weeds do not absolutely prevail over an attempt at another miserable crop of oats; for as long as the unambitious farmer gets something beyond the seed in return, he consoles himself for the deficiency in corn by supposing that the straw, being mixed with so great a quantity of grass, will prove an excellent substitute for hay. When the soil is at last suffered to rest for ten, fifteen, or twenty years, until it has again become mossed over for want of good management, it is once more subjected to the same sort of treatment. But on laying it down, that is, ceasing to plough it, no attempt is made to introduce any kind of grasses; but this, indeed, would be useless upon these *new* leys, as they are called, for there is already such an abundance of wild grass, docks, thistles, and other weeds, that it would be in vain for any sown grasses to contend with the rubbish already in possession of the soil. The quantity of hay yielded by new leys of the above description may not be so much deficient in quantity as it is in quality, and it is notorious to the parties who thus abuse parcels of good meadow land, that it requires several years to bring the new leys back to a state to yield hay of a quality even approaching that which they originally produced.

In those parts of the country where such deplorable management as that above narrated is still permitted to exist, the mode of living and the domestic arrangements generally, seem scarcely, if at all, to have made greater advances than agriculture. For although at the present day we may not commonly find the farmers' wives and daughters engaged in the manufacture of woollen, linen, and tow cloths and clothing, some of them still continue to spin the yarn for a linen web during the autumn and winter, and nearly all of them card and spin the material for coarse stockings for the family, while here and there, in the valleys and hill districts, may still be seen an ancient yeoman or farmer habited in the original "grey-coat," the garment being made of undyed wool, the produce of his own black and white sheep, carded and spun in his own family, woven by some country weaver or wabster, and fashioned into a coat by some itinerant tailor, who does not object to trudge several miles to a farmer's house, and there pursue his craft at the rate of a shilling or fourteen pence per day. Neither does the female part of the farmer's family object to assisting in the hay and harvest fields, as well as on some other particular occasions. The maid-servants and the daughters of small farmers may still be seen assisting to load the dung-cart, in the planting and digging up of potatoes, in taking batches of corn to the mill, in driving carts to some neighbouring market, and sundry other matters of a similar masculine character, all of which, in those parts of the country where agriculture has made the greatest progress, are now considered as exclusively belonging to the duties of the male part of our population. Indeed, the very term housewife, or huswife, which in many parts of the country is exclusively applied to the wives of farmers, clearly seems to apply to domestic or in-door employment; and the good or bad success of most farmers, particularly that class coming under the name of *small* farmers, very greatly depends upon housewifery:—

"Of huswife, doth huswifery challenge that name;
Of huswifery, huswife doth likewise the same;
Where husband and husbandry joineth with these,
There wealthiness gotten is holden with ease.

The name of a huswife, what is it to say?
The wife of the house, to the husband a stay;
If huswife doth that as belongeth to her,
If husband be witty, there needeth no stir.

The huswife is she that to labour doth fall,
The labour of her I do huswifery call;
If thrift by that labour be honestly got,
Then is it good huswifery, else it is not.

The woman the name of a huswife doth win
By keeping her house and of doings therein;
And she that with husband will quietly dwell,
Must think on this lesson, and follow it well."*

There is one duty in particular attached to most farming establishments, but of more or less importance according to the purposes to which farms are principally devoted: we refer to that of milking the cows. On dairy-farms this is a matter scarcely of secondary consideration to any other, since, besides the necessary labour that it requires twice a day, morning and evening, a certain attention to the operation of milking being performed carefully and honestly is not only desirable, but often really essential, and this devolves upon some trustworthy individual who occasionally superintends and ascertains that the whole of the milk has been extracted from the cows. We mention this subject here because custom, that arbitrary teacher, seems to define who shall be employed, and who shall not, in milking the cows. We will not attempt to define limits to the localities in which contrary customs prevail, for that is unnecessary to the elucidation of the object we have in view, namely, that in certain parts of the country cow-milking is exclusively assigned to the male part of the farm establishment; in other districts females are invariably employed at the milk-pail, while elsewhere we find both men and maidens, apparently without any preference, employed in the same cow-yard in this material part of the business of dairying. Bloomfield, that poet of Nature, in referring to this domestic duty, speaks, no doubt, of the custom prevailing in the part of the country where he was early employed as a "farmer's boy," and in that part of England (Suffolk), although we find milking the cows more generally performed by females, yet it is not exclusively restricted, as it is in many places, to them alone. Hear the poet describe what he himself used to take a part in, under the familiar appellation of Giles, when, having driven home the cows from the distant meadow, for the purpose of being milked he says,—

"At home the yard affords a grateful scene;
For Spring makes e'en a miry cow-yard clean.
* * * * *
Forth comes the maid, and like the morning smiles;
The mistress too, and followed close by Giles.
A friendly tripod forms their humble seat,
With pails bright scour'd, and delicately sweet.
Where shadowing elms obstruct the morning ray,
Begins their work, begins the simple lay;
The full-charged udder yields its willing streams,
While Mary sings some lover's amorous dreams;
And crouching Giles, beneath a neighbouring tree,
Tugs o'er his pail and chants with equal glee,
Whose hat with tattered brim, of nap so bare,
From the cow's side purloins a coat of hair,
A mottled ensign of his harmless trade,
An unambitious peaceable cockade.
As unambitious, too, that cheerful aid
The mistress yields beside her rosy maid;
With joy she views her plenteous reeking store,
And bears a brimmer to the dairy door;
Her cows dismissed, the luscious mead to roam,
Till eve again recall them loaded home."

Having introduced the subject of milking cows, it may not be out of place to follow up the suggestions that naturally present themselves, and introduce some few particulars connected with cattle and cattle-breeding, particularly as there is no other month in the year equal to the present one, March, for the production of calves, if we take the whole country into our calculation. But the breeding of cattle differs materially from the breeding of sheep; for notwithstanding that, in a few instances, farmers can manage to have a small portion of their ewes yielding their lambs as early as December, or in the beginning of January, the usual lambing season in the warmer and more fertile districts is February, and, in the colder and more inhospitable regions of our island,

* Tusser.

during this month and the following one: the ewes belonging to the mountain flocks would not yield nourishment sufficient to sustain their tender progeny until that period of the spring when the early vegetation afforded them a little food of a more succulent and nutritious nature than the dry and scanty pittance they had been accustomed to during the winter months. Cows, on the contrary, will propagate their species at any period of the year; and it consequently depends in most cases upon the views of the farmer or grazier regarding the ultimate profits arising from cattle of this description that we everywhere find some cows producing calves at one season of the year and some at another. Spring, however, is the principal season with breeders of stock in general, since calves produced early in spring commonly make out better, and are more profitable upon the whole (except such as are intended for the butcher), than those produced at any other season; whereas cows that calve several months before there is pasturage to supply them with grass, scarcely ever yield so much milk during the succeeding summer, as if the case had been otherwise, and hence the profits are lessened to whatever purpose the milk may be converted. However, in large and populous towns and communities there is a constant demand for milk (and butter too) throughout the whole year; so that those persons who keep dairies, and supply their customers during the summer months, are under the necessity of meeting the demand during the winter ones also, and hence a portion of their cows are always such as are in full milk—that is, newly calved. Much, however, is now effected by the use of turnips, mangel-wurzel, cabbages, carrots, and other succulent roots or vegetables, in the way of causing either cows or sheep to furnish a plentiful supply of milk during the winter; but then it is a well-ascertained fact that these vegetable productions cannot be cultivated but at a greater cost to the farmer than summer grass, and hence the system of *forcing* milk, as this might be called, is but little resorted to, except in situations where it at any time commands a remunerating price to the dairyman.

In the principal districts where cheese is made in large quantities, as for instance, Cheshire, Derbyshire, Gloucestershire, Dorsetshire, &c., the dairy-farmers invariably contrive to have their cows calving just sufficiently early in the season, so as to enable them to commence cheese-making at the period there is sufficient grass for the cows being turned out to pasture; and this process of cheese-making is regularly continued into the autumn; and in the early part of the winter the cows are no longer milked, as there exists a somewhat general opinion that cows that are allowed to go dry for three or four months before calving are apt to yield a greater quantity of milk during the next season. Besides, there is a saving in the expense of maintaining dry cows, for it is the general custom in the dairying districts to feed these cows upon straw and a small quantity of hay, or else a few turnips, after they no longer yield milk, until within a short period of their calving. In a future article we shall introduce the subject of cheese and butter making, and at a more congenial season than during the cold month of March.

The small kyloe cattle in some parts of Scotland are, at the present day, treated in a manner that appears one of peculiar kindness; but it rather, probably, proceeds from a view of greater convenience, as incurring less labour and expense than if they were treated in the ordinary way; since one rude dwelling is often found giving shelter to the family of a small farmer and two or three small cows. Garnet, in his 'Tour through the Highlands,' gives the following account of this circumstance or custom; and after describing the privations of the peasant, he continues—"Nor are his cattle in a better situation; in summer they pick up a scanty support among the morasses and heathy mountains; but in winter, when the ground is covered with snow, and when the naked wilds afford them neither shelter nor subsistence, the few cows, small, lean, and ready to drop for want of pasture, are brought into the hut where the family resides, and frequently share with them their little stock of meal, which had been purchased or raised for the family only, while the cattle thus sustained are bled occasionally to afford nourishment for the children after the mingled oatmeal and blood has been boiled or made into cakes."

In our last month's agricultural article we were induced to remark upon the excellence of most of Tusser's hints and advice, in his 'Five Hundred Points of Good Husbandry;' and notwithstanding it might probably be better to accord with his views, even in this instance—

> "To hunters and hawkers take heed what you say,
> Mild answer with courtesy drives them away;
> So where a man's betters will open a gap,
> Resist not with rudeness, for fear of mishap"—

it must be admitted that hunting—for hawking is no longer practised—at times severely exercises the farmer's patience and good-nature in curbing those feelings which naturally arise on witnessing a numerous field of sportsmen, among whom there probably may be several that cannot be considered his betters, wholly regardless of his interests, and seemingly unconscious of his forbearance—dashing directly across his farm, breaking down hedges and fences of all descriptions, injuring seriously his crops of young grain, and making outlets and inroads, so that his own and neighbour's farm-stock have opportunities of committing depredations on all sides with perfect impunity. In those parts of the country where the soil is of a heavy and clayey nature, inclining to wet, after the breaking of hard frost (particularly during February and March), and before the ground becomes settled and consolidated, the hoofs of the horses of forty or fifty sportsmen—or perhaps double that number—ploughing and plunging hock deep along the entire length of a field of young wheat, where the soil is of the character above alluded to, inflict almost incalculable mischief upon unoffending parties, without a shadow of right or authority to trespass upon them or their property in any way whatever. An eminent and modern poet, himself a keen sportsman, makes the following allusion to the subject:—

> "See, where yon simple fences meet,
> A field with autumn's blessings crowned;
> See prostrate at the Wildgrave's feet
> A husbandman with toil embrowned.
> 'O mercy, mercy, noble lord!
> Spare the poor's pittance,' was his cry;
> 'Earned by the sweat these brows have poured,
> In scorching hour of fierce July.'
> 'Away, thou hound! so basely born,
> Or dread the scourge's echoing blow!'
> Then loudly rung his bugle horn,
> 'Hark forward, forward, holla, ho!'
> So said, so done:—a single bound
> Clears the poor labourer's humble pale;
> Wild follow man, and horse, and hound,
> Like dark December's stormy gale.
> And man, and horse, and hound, and horn,
> Destructive sweep the field along;
> While, joying o'er the wasted corn,
> Fell Famine marks the maddening throng."*

This being the season for sowing spring corn, a few words may be said regarding the injuries farmers are supposed by some to suffer from the depredations of birds, particularly rooks. This matter has been the subject of controversy from time immemorial, although most of the older writers are decidedly in favour of destroying rooks, daws, magpies, ravens, &c.

> "Kill crow, pie, and cadow, rook, buzzard, and raven,
> Or else go desire them to seek a new haven.
> In scaling the youngest, to pluck off his beak,
> Beware how you clamber, for breaking your neck.†

* Sir Walter Scott—translation of the 'Wild Huntsman' by Bürger.

† Tusser: 'March's Husbandry.'

But with the exception of rooks, none of the birds here mentioned can be fairly accused of committing depredations on the recently sown seed; and even they infinitely prefer a grub or a lob-worm to a few grains of oats or barley. Where farmers have antipathies towards any of the others, they arise rather from the general character these birds bear than from the actual depredations they are known to commit; for although magpies, crows, and ravens have been known to attack young lambs and sheep that were too weak to defend themselves, these instances are but of rare occurrence, and, therefore, do not amount to any really serious grievance. As for buzzards, they are very scarce in most parts of the country; and in those districts where they are occasionally seen, their most heinous crimes consist in stooping to pick up a poult or chicken, which they carry off to regale their young ones upon. And even they seem to give a preference to a fine speckled frog, or a basking adder, and do not apparently interfere with the poultry-yard until hard pressed by hunger, and a tempting opportunity presents itself. Dr. Mavor, who edited the best edition of Tusser's 'Five Hundred Points of Good Husbandry,' makes the following observations upon the foregoing stanzas quoted from the poet-farmer:—

"In our moist climate, which naturally generates insects, if it were not for birds, and even some of those which are proscribed by vulgar prejudice, the fruits of the earth would be almost wholly destroyed. No doubt some species of the feathered tribes may become too numerous, if protected; but it is only during seed-time and harvest that birds do any injury, while their important services are continued the year round. Were parishes to pay for the destruction of vipers and of rats, it certainly would be more sensible and beneficial than setting a price upon the heads of sparrows. As for rooks, they are of the first utility to the farmer; and even the crow and the cadow, or jackdaw, are not destitute of valuable qualities, which may indeed be affirmed of the predaceous race in general, the least favoured of any."

As the art of agriculture has continued to advance until it has attained the comparatively perfect condition in which we find it at present, the condition of the farmer (except in some particular districts) has likewise continued to improve,—while that of the farm-servant and labourer has been nearly stationary; or, indeed, in some instances, it has absolutely retrograded: we refer only to his mode of living and general comforts.

"I grant indeed that fields and flocks have charms
For him that gazes, or for him that farms;
But when amid such pleasing scenes I trace
The poor laborious natives of the place,
And see the mid-day sun, with fervid ray,
On their bare heads and dewy temples play,
While some, with feebler heads and fainter hearts,
Deplore their fortune, yet sustain their parts;
Then shall I dare these real ills to hide,
In tinsel trappings of poetic pride?"*

Two hundred years ago persons occupying farms which are now rented at 150*l.* or 200*l.* a-year, associated at the domestic fireside, as well as at the daily family board, with the household servants, both males and females; nor was it considered any degradation, those easy, free, and familiar terms existing between master and man, and mistress and maid. In those days the generality of farm-houses were but little calculated for separate tables, and distinct places of accommodation for two parties; since the large hall, or house, or kitchen, or serving-room, as the principal apartment was named, according to the provincial usage of terms in different parts of the country, with a large chamber above, open to the thatch or tiling, often constituted the only two habitable rooms upon the premises. There was, indeed, besides the hall, the buttery or pantry, and the place of all-work devoted to baking, brewing, washing, &c., but very frequently these were buildings added to the principal one, and but one story high, and consequently admitting of no loft or chamber over head. Notwithstanding this scarcity of accommodation, according to our present ideas of such matters, in those days fewer labourers were employed, and hence it necessarily followed that more farm-servants were kept in the house. It will readily be conceived that this state of things tended to render the ordinary intercourse between master and man of a close and familiar nature; and the attachment of servants to the families in which they resided was often so powerful, deep, and lasting, that it ended but with their lives. But this will cease to be surprising when we reflect how matters stood, for the servants, in fact, were considered as forming part and parcel of the common household; and it was only the more worthless class of them that ever thought of seeking new places when once they had become domesticated in some farmer's family. In those days there is but little doubt that they had many and greater indulgences than farm-servants at present enjoy, and it is sincerely to be regretted that such is the case, since little indulgences and attentions bestowed upon dependents are usually more than repaid, for only good can be produced by the attachment of servants to their employers. This state of things, however, has been a consequence of the more marked distinction between the rank of the employer and the employed, arising from the greater necessity of capital by the former. Still the labourer has many compensating advantages over his predecessors, in the wider spread of mental instruction, and thence a far greater possibility of advancement to a higher rank than they could ever hope to obtain; nor is he, like them, any longer almost bound to the soil; but there is no doubt the household servants of an earlier age had an advantage in merely physical enjoyments. In the sixteenth century we find the "Ploughman's Holidays" thus enumerated, namely, "Plough Monday," "Shrovetide," "Sheep-shearing," "the Wake-day," "Harvest-Home," "Seed-cake," and "Twice a-week Roast:" these were commonly styled the "Plough-man's Feasting-days."

In speaking of these "feasting-days" Tusser makes the following observations, from which it is evident they were then old customs:—

"This would not be slipt,
Old guise must be kept.

Good huswives whom God has enriched enough,
Forget not the feasts that belong to the plough:
The meaning is only to joy and be glad,
For comfort with labour is fit to be had."

"Plough Monday" has long since ceased to be a day of peculiar observance amongst the farming community; but when the festivities of Christmas were celebrated among all classes, this was a memorable day with the rustic ploughman. Dr. Mavor remarks, "Till after Twelfth-day, very little country business of any kind used to be carried on. Feasting and visiting filled up the period between Christmas and that day, which was always observed with due solemnities. Plough Monday, which speedily followed, was to remind the cultivators of the earth of their proper business; and a spring was given to the activity of domestics by some peculiar observances. The men and maid servants strove to outvie each other in early rising on Plough Monday. If the ploughman could get any of the implements of his vocation by the fire-side before the maid could put on the kettle, she forfeited her shrovetide-cock. The evening concluded with a good supper."

"Plough Monday, next after that Twelfthtide is past,
Bids out with the plough; the worst husband is last:
If ploughmen get hatchet or whip to the screen,
Maids loseth their cock, if no water be seen."*

"Shrovetide, which usually falls in the early part of

* Crabbe: 'The Village.'

* Tusser: 'Ploughman's Feasting-Days.'

the present month, or in the latter part of February, continues to this day, in some parts of England, a sort of holiday rather than feast-day among domestic servants. When cock-fights were more in vogue than they are at present, in many country towns and villages these rude sports were celebrated on Shrove-Tuesday, and were attended by vast numbers of farming people—masters as well as men. In some parts of Northumberland, as well as the counties of Durham, York, and some others, this day, or at all events the afternoon, is still a holiday among the ploughmen and other agricultural labourers; and one of their chief recreations consists in foot-ball playing. The young men of the surrounding neighbourhood assemble at some appointed place in the town or village, when a person, delegated for that purpose, throws a foot-ball perpendicularly into the air, and it no sooner reaches the earth than the surrounding multitude commence an arduous and (very frequently) most severe struggle at this ancient game. The young men belonging to particular townships or districts unite in kicking it (driving, as it is called) in one direction, while their opponents, representing some other local districts, endeavour to kick it in a contrary one. The game is understood as being limited by certain boundaries in every direction, these being usually at the distance of a mile or two from the starting post; and unless one of the parties succeeds in driving the ball, probably after several hours' violent exercise, across the limits, the game remains undecided, and no victory is claimed. A dance in the evening often succeeds the foot-ball match, when the maid-servants join in the shrovetide holiday's amusements. Our space will not allow us to refer to other pastime and customs that seem to be remnants of the ancient modes of celebrating this once popular festival.*

"Sheep-shearing," another of the "ploughman's feasting days," though still necessarily returning with each returning year, has, and that even within the last thirty or forty years, sunk into a matter of mere ordinary farming business; and altogether ceased, except on some gentleman's estates, and in a few particular sheep-farming districts, to be a day of jollity and feasting as it was in olden times.

The "Wake-Day" is one of those partial rather than general observances, for while every small country town, or village that can boast a parish church, in some of our local districts, still continues to celebrate the Saint's day to which their church is dedicated, there are places where nothing of the kind prevails. Frequently, however, they are not called Wakes, but Feasts or Fairs. Again, in other parts of the country the inhabitants celebrate their Feast-Sunday,—that is, the Sunday nearest the Saint's day to whom the church is dedicated, and the feast will continue for two or three days afterwards. These feasting days, however, are not absolutely holidays among the farm-servants and labouring classes, although for the most part the afternoons, or a portion of them, and probably the whole night, are devoted to merry-making.

Of all the "feasting-days" the ploughman of former times seems to have been entitled to, that of the "Harvest-Home" is now the only one that still continues pretty general throughout the country at large. The "Harvest-Supper," provided for all those who have taken a part in securing the summer crops, and which generally concludes with dancing, is a custom so common in most rural districts, that it requires no further comment.

> "For all this good feasting, yet art those not loose,
> Till ploughman thou givest his harvest-home goose.
> Though goose go in stubble, I pass not for that,
> Let goose have a goose, be she lean, be she fat."†

"It appears," says Dr. Mavor, "that a goose used formerly to be given at harvest-home to those who had not overturned a load of corn, in carrying, during harvest Thus the shame of privation before his equals was wisely superadded to the sense of duty, in order to induce carefulness. We have lost the principle, but the practice of a good supper on finishing harvest is still continued, and no occasion can be more proper."

The ploughman's feast of the "Seed-cake," that is, an entertainment at the conclusion of seed-time, is now nearly if not wholly obsolete in every part of the kingdom. Tusser refers to it as follows:—

> "Wife, sometime this week, if the weather hold clear,
> The end of wheat-sowing we make for this year;
> Remember thou, therefore, though I do it not,
> The seed-cake, the pasties, and furmenty pot."

"Twice a-week Roast," though classed among the "ploughman's feasting-days," can hardly be said to have been the joyous and festive occasions similar to those already referred to, although no doubt they were welcome to those for whom the roasts were thus regularly prepared.

> "Good plowmen look weekly, of custom and right,
> For roast meat on Sundays, and Thursdays at night.
> Thus doing and keeping such custom and guise,
> They call thee good huswife—they love thee likewise."

Leaving holidays and feasting again for work, we may state that this month ought to be considered as terminating the season for farmers' getting their fences into proper order, as also their hedging and ditching, the neglect of which invariably betokens slovenliness, if not something worse, and the destruction of crops is often consequent thereon. A few remarks upon fencing may not be considered irrelevant to our present purpose.

It seems to have been an almost universal custom in former times, at a period when the present improved system of farming was entirely unknown, to plant trees, of one sort or another, in most of the hedge-rows; and even now, when new division-fences are made, we sometimes find this old custom resorted to, and by parties who cannot plead in excuse that they are ignorant of the ill effects produced to the various crops by these hedge-row trees. The bad effects from trees thus planted are strikingly obvious; for to whatever distance they send forth their roots, to that extent the crop of grain or grass is greatly impoverished, if not absolutely ruined. The hedge too suffers from the roots of the forest-trees, and the shadow they cast in various directions cannot but retard the maturing of the crops thus secluded from the sun's rays. However, in districts where farming is in the most flourishing condition, the farmers seem quite aware that the less the fences shade the crops, the better they are likely to prove.

The most common sorts of hedges are planted either with hawthorn, crab-tree, holly, blackthorn, or whitethorn, usually called quicks; but willow, elder, and furze are sometimes employed where the soil seems adapted to their growth; and maple and hornbeam are found in many of the old hedge-rows.

In planting hedges, the nature of the soil should be considered, for it would be perfectly absurd to plant holly in swampy ground, or willows in dry and stony places. In most parts of the country the whitethorn is more used than any of the other sorts, being more rapid in its growth, and more easily propagated, and hence requiring a shorter time to be protected from the cattle by what may be termed artificial means. Blackthorn and crab-tree form good fences, particularly for the boundaries of farms; but the soil should be of a tolerable quality, else they rarely attain a perfect state. Blackthorn possesses some excellent properties; it is far more durable than whitethorn, and its branches are therefore well calculated for making dead hedges or mending gaps. Neither are blackthorn hedges liable to be cropped by cattle; but it is not so easily or quickly raised as whitethorn, and its roots penetrate the ground to a much greater extent,

* See account of "Foot-ball Play at Derby," in 'Penny Magazine,' No. 450, p. 131, volume for 1839.

† Tusser: Ploughman's Feasting-days.

* Tusser; 'Ploughman's Feasting-days.'

Holly makes an excellent as well as beautiful fence, a better in fact than almost any species of thorn; but there is a difficulty in getting it to grow, and it grows but slowly. When it does grow, however, it makes ample amends by its strength, thickness, and durability. It delights in a strong soil; but if it once take root, it will thrive even among rocks and stones. Except upon dry sandy banks, furze is seldom planted hedge-row fashion; but since it will thrive in such a situation, where most other hedging materials would perish, it is sometimes found desirable to plant hedges of furze. Willows and elders are adapted for moist and marshy soils; the latter, particularly, may be planted on the margins of brooks and rivers to great advantage, for the moisture will cause them to thrive, while their numerous roots and suckers will have the effect of preventing the stream undermining its banks.

Hedges formed of quicks, or, indeed, all hedges, while the plants are young, should be kept clean by frequent weedings; and where young quicks get stunted in their growth, so that the shoots are weak, it is usually the best plan to cut them off within an inch or two of the ground, the effect of which is causing them to throw out much stronger shoots than before. Hedges of this sort are commonly ready to plash at the end of nine or ten years after their being planted; but much depends, in this respect, upon the nature of the soil and the form of the ground upon which the hedge-rows stand. The best time for plashing is during October or February. A practical writer makes the following remarks upon plashing hedges:—"Two extremes are to be avoided in the plashing of quicks; the first is the laying the plashes down too low and too thick, because that makes the sap run wholly into the shoots, and leaves the plashes without nourishment, which, with the thickness of the hedge, kills them; the second is not to lay them too high, because this draws all the sap into the plashes, stints the shoots at the bottom, and renders the hedge so thin, that it will neither hinder cattle from going through nor from cropping it. When the shoot designed to be plashed is bent, give it a small cut with a bill, half through, slanting a little downward; then weave it about the stakes, and trim off the small superfluous branches that straggle too far out on either side of the hedge."

Thorn hedges that have been properly managed will last almost for ages with a little care in constantly supplying gaps that are caused by the failure of old stocks with younger plants; but indeed the thorn is one of the most durable of all our deciduous trees or shrubs, as the sturdy but time-worn stem of many an ancient thorn, to be met with in the domains belonging to our nobility and gentry, bears ample testimony.

"Yon thorn—perchance whose prickly spears
Have fenced him for three hundred years
While fell around his green compeers—
Yon lonely thorn, would he could tell
The changes of his parent dell,
Since he, so grey and stubborn now,
Waved in each breeze a sapling bough;
Would he could tell how deep the shade,
A thousand mingled branches made;
How broad the shadows of the oak,
How clung the rowan to the rock,
And through the foliage showed his head,
With narrow leaves and berries red;
What pines on every mountain sprung,
O'er every dell what birches hung,
In every breeze what aspens shook,
What elders shaded every brook!"*

We stated in a preceding supplementary number that farming could not be carried on without capital; the necessary amount of capital, however, in some measure depends upon the nature and character of the farm, that is, whether it be a grass or a grain-growing farm. A grass farm requires a little more outlay in farm-stock in the first onset; but then there is a smaller outlay in wages and farming implements; and if the incoming tenant has to pay the outgoing one for the crops of grain in the ground, then a larger sum will be found necessary to meet the first year's expenses for an arable farm than of one devoted to grazing. And here we venture to make a somewhat general remark, which is this, that in agricultural districts generally, wherever we observe more than ordinary bad management upon any particular farm or farms, in a great majority of such cases, depend upon it, it proceeds from a want of funds to enable such farmers to farm as well as their neighbours. In almost any case a sum of 500*l.* would be amply sufficient, with proper management, for him who rents a farm of 100*l.* per annum; but as rents increase, the amount of capital necessary in farming affairs would not increase in quite a corresponding ratio, since certain expenses, such as household expenses, farming implements, &c., would not require to be doubled, although the rent should be fully twofold. Thus, if a farm, as above stated, of 100*l.* a year rent, requires 500*l.* capital to stock and manage it, a farm of 200*l.* a year would require something less than a 1000*l.*, or double the amount of the other. Supposing the farm of 100*l.* per annum to be an arable one, a farmer beginning the world would be called upon to make the following disbursements the first year:—household and kitchen furniture, 70*l.*; farm stock, including four or five horses, averaging 16*l.* or 18*l.* each, a couple of cows and some young cattle of different ages, with probably a few sheep, altogether amounting to 160*l.*; farming implements, including two ploughs, as many harrows, a roller, drill, &c., with one waggon and two carts, or a couple of waggons, amounting to 65*l.*; servants' and labourers' wages, 35*l.*; provisions, 50*l.* (exclusive of what might be derived from the farm during the second half-year); sundries, 20*l.*; and half a year's rent, 50*l.* Thus we have an outlay of 450*l.*, without applying anything towards the value of the crop of grain in the ground at the time of coming into possession of the farm. Neither have we included more than half a year's rent, because upon arable farms there is sufficient time to get a portion of the grain to market before the second half year's rent falls due. However, it is infinitely better for the farmer to keep a little within the limits of his capital, be it what it may, since a little surplus capital affords him an opportunity of taking advantage of the markets, instead of being compelled, no matter how low prices of corn may happen to be, to send his produce to market in order to meet his engagements. The same thing would partially apply to dairy farms, but not so decidedly; for as the produce of these farms, cheese and butter, is of a more perishable nature than corn, the farmer cannot wait an extra year, or indeed half a year, in order to obtain higher rates for his farm products.

Many landlords object to granting leases of farms, preferring to let them from year to year, in order that they may ever have an opportunity of taking advantage of the times, but not always feeling disposed to lower their rents, even when a pressing necessity demands it. This plan generally cannot be condemned in too strong terms; and except in cases where the land has previously been brought into a state of peculiar productiveness, and the object is to keep it in the best possible condition, this custom of letting farms from year to year has not anything to recommend it. But if, as above stated, a tenant enters upon a farm in excellent cultivation, should it be discovered that he is either a bad manager, or that he would impoverish the soil if allowed to remain upon it, this letting by the year affords an opportunity of getting rid of such a tenant before he does much injury to the property. Very long leases are equally objectionable, since they afford the tenant an opportunity of enjoying advantages over the landlord (if the contracts contain no restrictive clauses); for when the leases extend to terms of

* Sir W. Scott: 'Marmion,' introduction to canto ii.

twenty-one or more years, the best farm may become greatly reduced in value before the expiration of the lease. Under certain cases the tenant may be the sufferer; for should rents be high when a long lease is entered upon, with all the privileges it allows him of cultivating the soil in any way he pleases, such a depreciation in the value of farm products may take place during so long a period, that the long lease may effect his utter ruin.

Although farms at the present day are divided, generally speaking, into arable and grass farms, yet the latter sort may properly be divided again into two distinct kinds, namely dairy and grazing farms, the former producing butter and cheese, while the latter are devoted to the pasturing of lean or fat stock, or probably a portion of both. In some sections of the country the farms have no decided character, being partly devoted to grazing and partly to dairying, while some portion of them is always kept under tillage; whereas in several other parts of the country they are exclusively devoted to one or other of the above peculiar distinctions. There can be no doubt but rich meadow land is better adapted to grass than to grain; but it is frequently a very doubtful matter whether soils of an inferior grade are more profitable when kept under the plough in an arable state, or laid down to grass and grazed. This depends, however, in a great measure upon the price of corn in comparison with farm stock, and very materially upon the local situation of such farms; for since indifferent soils require a considerable quantity of manure of one sort or another, to insure tolerable crops of grain, should a farm be situated inconveniently for procuring the requisite supply, then most likely it would yield a better profit to the occupier if kept under grass, and so applied to grazing. It therefore commonly happens that when the price of corn continues high for a few seasons, that a greater breadth of acres is brought under the plough; but when the reverse occurs, that is, when corn sells at a low rate for a few years, these indifferent corn soils are again laid down to grass and grazed. It is, however, an unusual thing to find more than solitary instances of change of this sort, even when the greatest fluctuations in the value of the different kinds of farm produce take place; for where whole districts have changed their systems of husbandry, the changes have been slow and gradual, and brought about by an improved knowledge of the peculiar properties of the soil, its adaptation to the production of certain crops, rather than to any change from time to time in the relative value of the different sorts of farm products. A knowledge of the peculiar properties of soils in persons connected with farming is almost as necessary as an acquaintance with the nature and qualities of medical drugs and their preparations in persons practising the profession of physic. Hear the opinion of the ancients:—

> "To know the culture, habit of the grounds,
> What this refuses, and in what abounds;
> Nature on each her nursing care bestows,
> Here springs the corn, there the rich vineyard glows;
> While fruit-trees bud to deck another place,
> And grasses flourish with unbidden grace."*

It is no more than reasonable to suppose that farmers in general cannot be ignorant of the fact, that to farm land of a rich soil at double the rent of that which is poor, is invariable to be preferred; and yet it actually happens that numbers of what we should call smart intelligent farmers seem to prefer acting directly the reverse of this, being only anxious to occupy a large breadth of acres. Now, to cultivate an acre of poor land requires, at the least, as great an amount of labour as an acre of richer soil, and yet the amount of produce probably will not exceed one-half. Suppose the crop to be wheat, the poor soil will probably yield two quarters per acre, the superior soil four quarters; and calculating that wheat is worth 7*s.* 6*d.* per bushel, or 3*l.* a quarter, there would be a clear excess of 6*l.* an acre in favour of the good soil, while the probability is that the extra rent would not be over twelve or fifteen shillings, or twenty shillings at the most. It is true that somebody must rent lands of an inferior quality; but what is here intended to be strongly urged is this—that where a farmer has the option of renting 200 acres of good land, or 400 acres of poor land, in most cases it would be greatly to his advantage to engage the former. It may be true that large profits have occasionally been reaped from large farms that have originally been poor; but this has been effected where the occupants possessed the means of investing considerable sums in reclaiming and improving these poor soils, and who not only possessed the means, but also the practical knowledge necessary to bring about the desired beneficial results. Long leases too, in such cases, are absolutely necessary; and the times, as the farmers express themselves, must be on the whole favourable.

Before we close this month's agricultural article, we will make a few observations, which, with all due deference and respect for the farming community at large, we are disposed to believe might be of service if duly attended to. Now, with regard to early and late sowing, each of which has numerous advocates and supporters, but upon which, among first-rate practical agriculturists, there is still a diversity of opinions, very few writers appear to have taken what we consider the proper view of the case; since nearly all of them are the advocates or opponents of early sowing. How a novice in farming affairs would be puzzled, after reading a dozen authors who recommended this, and a like number, equally intelligent, who declare it to be wrong! To us it seems quite clear, that in a climate so variable and uncertain as ours, that it is a piece of perfect absurdity to insist upon getting spring crops into the ground at any particular dates; for suppose, for instance, the time appointed by the advocates for early sowing to be the 20th of February, it is not at all improbable that frost or snow might prevent it, or there might be a succession of continued rains; and every farmer is aware of the impropriety of sowing or planting when the ground is in an unfit state. But the advocates for early sowing, being too anxious to keep to their adopted dates, would, under such circumstances, be likely to seed their ground while it was in an unfavourable condition, rather than wait until a change of weather brought it into a better state, and hence the great probability of an indifferent crop; since all must admit the great advantage of sowing when the soil is in a favourable condition for the reception of the seed. Under such circumstances it is more than probable that the advocate for later sowing would surpass his neighbour in the productiveness of his crops in such a season. The next season the case here supposed might happen to be reversed, for an early and long continuance of dry weather might favour the advocate for early sowing, and his crops in consequence would probably turn out superior to his neighbour's. The nature of the soil also ought to be considered, since so much depends upon its quality and condition, that what would be a prudent plan to pursue upon one kind of soil might be an equally imprudent one to adopt upon soils of a totally different character. Thus it is that the prudent manager of farming affairs, though possessing all practical knowledge connected with his art, permits himself to be governed in a great measure by circumstances over which he has no control, and does not, in opposition to reason and common sense, persist in forcing nature out of her ordinary course, but rather watches with a judicious observation the times and the seasons, always prepared to act when a favourable opportunity occurs. Linnæus has said, "Perhaps we cannot promise ourselves a happy success by any means so likely as by taking our rule for sowing from the leafing of the trees. We must for this

* Virgil's 'Georgics,' book i.

end observe in what order every tree puts forth its leaves, according to its species, the heat of the atmosphere, and the quality of the soil. Afterwards, by comparing together the observations of several years, it will not be difficult to define from the foliation of trees, if not certainly, at least probably, the time when annual plants ought to be sown. It will be necessary likewise to observe what sowings made in the different parts of the spring produce the best crops, that by comparing these with the leafling of trees, it may appear which is the most proper season for sowing; nor will it be amiss in like manner to note at what time certain plants, especially the most remarkable in every province, blow; that it may appear whether the year makes a quicker or slower progress."

A Journal of the Arrival of the Migratory Summer Birds at Wokingham in Berkshire, from 1829 *to* 1839 *inclusive, noticed by J. R. Wheeler.*

	Wheat-ear.	Chiff Chaff.	Wryneck.	Large Willow Wren.	Swallow and Martin.	Nightingale.	Swift.	Cuckoo.	Black-Cap.	Whitethroat.	Flycatcher.	Shrike, red-backed.	Turtle Dove.	Redstart.	Night Hawk.	Garden Warbler.	Lesser Willow Wren.	Yellow Wagtail.
1829	Apr. 1	April 6	April 6	April 11	April 14	April 16	May 4	April 23	April 16	April 16	May 6	May 6	May 8	April 14	May 2	Ap. 11	Ap. 11	May15
1830		Mar. 13	Mar end	[At the	end of	March]	May 2	March	April 7	. .	May 2		May 2	April 7	May 2		March	.
1831		Mar. 18	April 8	April 14	April 14	April 6	. .	. .	April 8	April 9	.	June ge-	.	April 14	.		April	.
1832		Observa	tions ne	glected.	. .	. .	. .	. .	. .	. .	.	nerally.	.	. .	.		.	.
1833		April 22	April 7	April 5	April 13	April 6	May 4	April 22	April 6	April 6	May 7		May14	April 13	May14	Apr. 5	Apr. 5	Ap. 20
1834		Mar. 10	. .	April 10	Swallows March 10, and Martins May 3	April 20	May 3	April 21	April 10	April 10	May11	May23	May 9	April 20	.		April	
1835	Apr. 4	April 2	April 4	April 6	April 10	April 16	Ma. 8	April 13	. .	. .	May24	June 5	May20	. .	.		.	
1836	.	April 23	April 14	April 23	April 21	April 11	May13	April 15	April 26	April 27	May18		May14	April 24	.		Ap. 21	
1837	May	. .	April 25	May 1	April 3, 1 Swallow, and on the 20th generally.	April 26	May 2	May 2	May	. .	May25	May and	.	. .	.		May	
1838	.	. .	. .	. .	April 11	April 23	May 3	April 10	April 16	. .	May23		May15	April 17	.		.	May11
1839	Apr. 5	Mar. 17	. .	April 18	April 20	April 18	May	April 13	. .	. .	.	May11	.	. .	.		Ap. 17	May19

Bird of partial migration.

Is generally seen at the same time as the Willow Wren.

From April to June.

MONTHLY CALENDAR.—APRIL—Fourth Month.

Day of the Mouth and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock bef. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h. m.		h. m.	h. m.
1 W	92	. . .	5 37	3 53	6 32	28·3	5m 3	5a21
2 Th	93	. . .	5 35	3 35	6 33	●	5 16	6 50
3 F	94	. . .	5 33	3 17	6 35	0·9	5 30	8 18
4 S	95	. . .	5 31	2 59	6 37	1·9	5 47	9 52
5 *Su*	96	5 *Sunday in Lent.*	5 28	2 42	6 38	2·9	6 11	11 22
6 M	97	Old Lady-Day	5 26	2 24	6 40	3·9	6 46	morn.
7 Tu	98	. . .	5 24	2 7	6 42	4·9	7 36	0 47
8 W	99	. . .	5 22	1 50	6 43	5·9	8 43	1 51
9 Th	100	. . .	5 19	1 33	6 45	☽	10 3	2 36
10 F	101	Camb. Lent Term ends.	5 17	1 17	6 46	7·9	11 27	3 7
11 S	102	Oxford Lent Term ends	5 15	1 0	6 48	8·9	0a50	3 29
12 *Su*	103	6 *Sun in Lent. Palm Sun.*	5 13	0 44	6 50	9·9	2 10	3 44
13 M	104	. . .	5 11	0 28	6 51	10·9	3 25	3 57
14 Tu	105	. . .	5 8	0 13	6 53	11·9	4 40	4 8
15 W	106	Easter term begins.	5 6	after 2	6 55	12 9	5 54	4 19
16 Th	107	. . .	5 4	0 17	6 56	○	7 8	4 30
17 F	108	*Good Friday.*	5 2	0 31	6 58	14·9	8 22	4 42
18 S	109	. . .	5 0	0 45	7 0	15·9	9 36	4 58
19 *Su*	110	*Easter Day.*	4 58	0 59	7 1	16·9	10 48	5 19
20 M	111	Easter Monday.	4 56	1 12	7 3	17·9	11 53	5 47
21 Tu	112	Easter Tuesday.	4 54	1 25	7 5	18·9	morn.	6 26
22 W	113	Easter Wednesday.	4 52	1 37	7 6	19·9	0 47	7 18
23 Th	114	St. George.	4 49	1 49	7 8	20·9	1 29	8 22
24 F	115	. . [b. 1776	4 47	2 0	7 10	☾	2 0	9 34
25 S	116	*St. Mark. Duch. of Glouc.*	4 45	2 11	7 11	22 9	2 23	10 51
26 *Su*	117	1 *S. aft. East. Low Sund.*	4 43	2 21	7 13	23·9	2 40	0a10
27 M	118	. . .	4 41	2 31	7 15	24·9	2 55	1 30
28 Tu	119	. . .	4 40	2 40	7 16	25 9	3 8	2 51
29 W	120	Oxf. and Camb. Easter	4 38	2 49	7 18	26·9	3 20	4 15
30 Th	121	[Terms begin.	4 36	2 57	7 19	27·9	3 34	5 43

Meteorological Averages.

Barometer.	Ins.
Mean height	29·881
Highest .	30·540
Lowest .	29·200
Hygrometer.	°
Mean dew-point	43·5
Highest .	58
Lowest .	27
Mean dryness	6·4
Mean greatest do. of day .	12·8
Greatest dryness	26
Thermometer.	
Mean temperature	49·9
Highest .	74
Lowest .	29
Radiation.	
Mean great. of Sun	28·1
Greatest power	47
Mean cold of terrest.	6·2
Greatest ditto	14
	Ins.
Mean qty. of rain	1·786
Mean of evap.	2·290

Table of the Winds.

	Days.	Dew-P.
N. .	2½	40°
N.E. .	3¼	40·5
E. .	3	45
S.E. .	3½	49
S. .	2¾	47
S.W. .	4	45
W. .	5½	44
N.W. .	5½	42

SUNDAY LESSONS.

April	MORNING.		
5	5 Sun. in Lt.	Exod. 3	Acts 2
12	6 „	„ 9	Mtt. 26
17	Good Fridy	Gn. 22 to v. 20	John 18
19	Easter day	Ex. 12	Rom. 6
26	1 aftr East.	Nb. 16	Acts 23
	EVENING.		
April 5	Exod. 5		Heb. 7
„ 12	„ 10		Heb. 5 to v. 11
„ 17	Isaiah 53		1 Pet. 2
„ 19	Exod. 14		Acts 2 to v. 22
„ 26	Numb. 22		1 Jn. 2

THE MOON'S CHANGES.

New . . . 2d day, 3h. 21m. aft.
First Quart. 9th day, 6h. 22m. mn.
Full . . . 16th day, 7h. 55m. aft.
Last Quart. 24th day, 11h. 47m. aft.

Day of Mth.	Length of Day.	Day's increase	Day break.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	
1	12 55	5 10	3 38	8 32	16′ 1″
6	13 14	5 29	3 23	8 43	15 59
11	13 33	5 48	3 8	8 56	15 58
16	13 52	6 7	2 53	9 9	15 57
21	14 11	6 26	2 37	9 23	15 55
26	14 30	6 45	2 21	9 37	15 54

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TUNISIAN MANNERS.

PUBLIC PROCESSION.—THE BEY'S INAUGURATION.—THE DIVAN.—NUPTIAL DOINGS.

[From the Rev. J. Ewald's 'Journal.']

[Tunis.]

Tunis; *October* 15.—Great apprehensions have been entertained here for some months in consequence of the report that the Turks intended to proceed against Tunis in the same manner as against Tripoli, and that the Grand Seignior was fitting out a fleet destined for this place. In confirmation of the rumour, nothing had been heard of the Sachab Ettaba, who had gone to Constantinople some time since, to fetch a caftan for the new Bey. His arrival, however, a few days ago, banished all these fears, particularly as he had concluded his business to the entire satisfaction of the Bey. His quarantine having expired, he this morning made his public entry, and proceeded to his country-house, Sidi Ismael, which is situated between Tunis and Bardo, the residence of the Bey. The chief members of the divan met him on horseback, about half way between this place and Gouletta. Three thousand men also advanced to welcome him and to conduct the ambassador to his own dwelling. The procession was beautifully arranged; in front came the members of the divan, aged venerable-looking men; next appeared the Sachab Ettaba, on a richly caparisoned horse, in the new uniform of a general, blue with gold epaulettes, bearing in his right hand a blue silk bag, containing the firman of the Turkish emperor, and in his left another blue silk bag, in which was a sword, sent to the Bey by the Grand Seignior. Yesterday the solemn recognition of the Bey took place, and, wishing to see it, I went to Bardo, the residence. The throne was set up in the great fore-court of the castle, and towards eight o'clock the Bey appeared, surrounded by the princes, who were followed by his five headsmen, in red uniforms. When the Bey sat down on the throne, the princes ranged themselves on the right, and the headsmen with the nobility on the left. The chief headsman then pronounced a blessing, in a loud voice, upon which the nobles approached and kissed the Bey's hand. All the members of the divan, consisting of three hundred autopashas and four hundred bulkpashas, now made their appearance. The whole government is of Turkish origin, for which reason all the members of the divan must be soldiers and of Turkish descent. Immediately on the birth of a boy whose father is of Turkish blood, he receives a pension of a nasri daily. After he has attained the age of fifteen, he is enrolled as a soldier, and has four nasri per day. After having served for some time he is raised to the dignity of autopasha, and afterwards to that of bulkpasha, which constitutes him a member of the divan. Formerly the standing army was entirely composed of Turks; no Moors were admitted into it, and even now all the fortresses of the country are garrisoned with Turks. But as the army has now been reorganised, and consists of about five thousand men of all nations, the Turkish militia is losing its influence, and will, in all probability, be gradually abolished. The members of the divan were formerly dressed in a very singular manner, but their present costume, which is according to the pattern set by the Grand Seignior is

very simple; they all appeared without turbans, but wore the red caps, or schasehia. When the divan had entered, all the officers and subalterns of the two new standing regiments came in, followed by the European consuls. Only the members of the divan had seats. As soon as the various persons were assembled round the throne, the flags and the horse-tails were brought in. The Saehab Ettaba now made his appearance, with the robe of honour which he had brought from Constantinople, consisting of an upper coat or cloak, which the Bey immediately put on. He then decorated him with the sultan's order, which was composed of brilliants, and girded him with the new sword; the firman was read aloud, together with numerous other congratulatory letters which the Bey had received from Constantinople. The assembly was then permitted to kiss the hand of his Mohammedan highness, an honour which was extended to the European consuls. The military band played, and coffee was handed round.

It is customary at all the great festivities to invite the European consuls to court. Some years back this was the case, at the nuptials of a prince, the son of the Bey, who, in addition to his four wives, was going to marry the daughter of the Saseh Mufti, chief of the ecclesiasties. The consuls were invited the day before the wedding, but the English consul, who did not mean to be present, lent me his carriage, and I proceeded with the rest of the consuls to the residence. On arriving at the court we drove through a covered archway, which led to the entrance of the fore-court, where a crowd of armed Mamelukes were stationed. We alighted in the grand square in front of the palace, and found a great number of Arabs and Moors, who had come to congratulate the Bey. We were conducted into the chamber of the chief secretary of state, and soon informed that the Bey was ready to receive us. We were then led into the interior of the palace, to the Bey's great state-chamber, before the entrance of which sat numerous female slaves, singing and playing on musical instruments. The hall into which we were ushered had no window, and was illumined only by a single wax-light. I could scarcely see anything, and groped about like a blind person. This darkness lasted, however, but a moment, and by the feeble glimmer of the wax taper I perceived the Bey in the back-ground, seated upon his throne. He was dressed in blue silk, wore a gold dagger in his girdle, and a large brilliant on his finger, which, in the obscurity of the apartment, showed a magnificent play of colours. The consuls approached his highness and kissed the flat side of his hand, an honour which is granted only to the Christians, and which was also extended to me. The Mohammedans always kiss the hollow of the hand. When we had seated ourselves to the right and left of the Bey, I had leisure to look about me a little. What a surprise! for the first moment I fancied myself translated to a fairy palace. The walls of the saloon were hung with tapestry embroidered in gold, and a multitude of richly-adorned females were ranged along the sides of the room. Daggers, sabres, guns, ornamented with gold and precious stones, were hung all round. Clocks, fine porcelain, and all sorts of rich European furniture were scattered about in strange confusion, and the floor was covered with a most costly carpet. The obscurity of the dimly-lighted saloon, the dazzling glitter of the gold and precious stones, the incessant ticking and striking of the clocks, the presence of the whole court, of the Christian consuls, the Bey with all his family, combined to make altogether a wonderful impression upon me. After a short pause, refreshments were handed round, and while we partook of them, the military band, stationed outside, struck up.

The Bey put several insignificant questions to the consuls, to which they made similar replies. We had passed about half an hour in this enchanted hall, when the Bey arose, which was a signal that the audience was over. We were conducted through the various apartments of the harem, and saw all the costly articles they contained. The bride's chamber was distinguished by its beauty and richness. When we had finished our wanderings, we found the Bey and his court standing in a great hall, where he dismissed us very graciously. The same day, at three o'clock, the bride made her entry into the palace. The road from Tunis to Bardo was lined on both sides with crowds anxious to see the procession. The Arabs had horse-races, and diverted themselves with their national games, even upon the public road. The game consisted chiefly in mounting their horses with the rapidity of an arrow, and loading and firing their long guns while riding. About three o'clock the procession, with the bride, left the gate of Tunis, and slowly took the road to Bardo. It was opened by twenty-eight covered carriages, containing the female relations of the bride, followed by the carriage of the bride, drawn by eight mules, each led by two of the body-guard, large parties of whom also surrounded the carriages. The procession was closed by a crowd of carriages and horses. The next morning the consuls' ladies were invited to visit the bride, a favour never granted to the men. They were sumptuously entertained, and conducted to her apartment, where she was seated on an elevated throne. She was laden with precious stones, and, not being permitted to move, or even to lift up her eyes, she sat the whole day like a statue, looking on the ground, to be quietly gazed at.

Soon after this wedding, I was present at that of the Saehab Ettaba, to whom the Bey gave one of his daughters in marriage, on which occasion a very singular circumstance occurred. When the Saehab Ettaba for the first time entered a room with his bride, she trod upon his toe, which is a sign of content, and implies that the husband is to be the slave of the wife, she being a princess both by birth and authority. It was so understood by the proud minister, who left the apartment in a rage, and instantly repaired to the Bey to demand vengeance for the insult. The Bey and his whole court were thrown into the greatest consternation, and he immediately summoned all his wives to ascertain which of them had urged the young princess, who was only thirteen years of age, to this step. It turned out to be her sister, who was in like manner married to a person in high rank, who had raised himself from a state of slavery. The women were punished, and the offended minister left Tunis the same day, and repaired to the interior to extort money from the Bey's subjects.

THE MANUFACTURE OF SHIPS' BISCUITS.

The application of machinery to manufactures is valuable in proportion to the number of articles of *one kind* required to be produced; since if there be no likelihood of a large demand arising for any one article, it is not often that the expense of fitting up machinery is willingly incurred: but let it be an article for which a demand is at all likely to arise, and nothing is too trifling to be considered unworthy of the application of machinery. It is probable that some of our commonest children's toys would present instances of this; but the articles of production to which the present paper refers, though trifling in individual value, have collectively an importance which renders them worthy of a brief notice.

Ships' biscuits are now made by machinery; and one of the reasons for this has been that the manual preparation of them was too slow and too costly during the last war. A landsman knows very little of the true value of a biscuit: to him it is a trifle—an occasional apology for a meal; and whether he calls it "Abernethy," "butter," "fancy," or "sponge" biscuit, he deems it nothing but a trifle. With a seaman it is far different: to him biscuit is *bread*—the only bread that he eats for months toge-

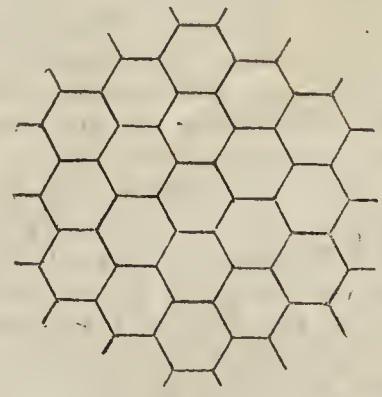
ther. There are many reasons why common loaves of bread could not be used during a long voyage; the principal is, that, containing a fermenting principle, or leaven, they would soon become musty and unfit for food, if made previous to the voyage; while the preparation of them on board ship would be subject to numerous objections, which we need not stop to explain. Biscuits contain no leaven, and being well baked throughout,* they suffer but little change during a long voyage.

The allowance of biscuit to each seaman on board a king's ship is, we believe, about a pound per day (averaging six biscuits to the pound). The supply of a man-of-war for several months is consequently very large; and it often happened during the last war that the difficulty of making biscuit fast enough was so great that at Portsmouth waggon-loads were unpacked in the streets and conveyed on board ships just on the point of leaving the harbour, there not being sufficient time to convey the biscuit from the contractors to the victualling-department in the usual way. Some of the biscuits were baked in the Royal yards, and some contracted for.

We shall now describe the mode of making biscuits by hand; and afterwards speak of the improved method. The bakehouse at Gosport contained nine ovens, and to each was attached a gang of five men—the *furner*, the *mate*, the *driver*, the *breakman*, and the *idleman*. The requisite proportions of flour and water were put into a large trough, and the *driver* with his naked arms mixed the whole up together into the form of a dough—a very laborious operation. The dough was then taken from the trough and put on a wooden platform called the *break*. On this platform worked a roller, called the *break-staff*, five or six inches in diameter, and seven feet long. One end of this was loosely attached by a kind of staple to the wall, and the *breakman*, riding or sitting on the other end, worked the roller to and fro over the dough, by an uncouth jumping or shuffling movement. When the dough had become kneaded by this barbarous method into a thin sheet, it was removed to the moulding board, and cut into slips by means of an enormous knife; these slips were then cut into pieces, each large enough for one biscuit, and then worked into a circular form by the hand. As each biscuit was shaped it was handed to a second workman, who stamped the king's mark, the number of the oven, &c., on the biscuit. The biscuit was then *docked*, that is, pierced with holes by an instrument adapted to the purpose. The finishing part of the process was one in which remarkable dexterity was displayed. A man stood before the open door of the oven, having in his hand the handle of a long shovel called a *peel*, the other end of which was lying flat in the oven. Another man took the biscuits as fast as they were formed and stamped, and jerked or threw them into the oven with such undeviating accuracy that they should always fall on the peel. The man with the peel then arranged the biscuits side by side over the whole floor of the oven. Nothing could exceed (in manual labour alone) the regularity with which all this was done. Seventy biscuits were thrown into the oven, and regularly arranged in *one minute*, the attention of each man being rigorously directed to his own department; for a delay of a single second on the part of any one man would have disturbed the whole gang. The biscuits do not require many minutes' baking; and as the oven is kept open during the time that it is being filled, the biscuits first thrown in would be overbaked were, not some precaution taken to prevent it. The moulder therefore made those which were to be first thrown into the oven larger than the subsequent ones, and diminished the size by a nice gradation.

The mode in which, since about the year 1833, ships' biscuits have been made by machinery is this:—The meal or flour is conveyed into a hollow cylinder four or five feet long and about three feet in diameter, and the water, the quantity of which is regulated by a gauge, admitted to it. A shaft, armed with long knives, works rapidly round in the cylinder, with such astonishing effect that, in the short space of two minutes, five hundredweight of dough is produced, infinitely better made than that mixed by the naked arms of a man. The dough is removed from the cylinder and placed under the breaking-rollers. These latter, which perform the office of *kneading*, are two in number, and weigh fifteen hundredweight each. They are rolled to and fro over the surface of the dough by means of machinery, and in five minutes the dough is perfectly kneaded. The sheet of dough, which is about two inches thick, is then cut into pieces half a yard square, which pass under a second set of rollers, by which each piece is extended to the size of six feet by three, and reduced to the proper thickness for biscuits.

This sheet of dough is now to be cut up into biscuits, and no part of the operations is more beautiful than the mode by which this is accomplished. The dough is brought under a stamping or cutting-out press, similar in effect, but not in detail, to that by which circular pieces for coins are cut out of a sheet of metal. A series of sharp knives are so arranged that by one movement they cut, out of a piece of dough a yard square, about sixty *hexagonal* biscuits. The reason for a hexagonal (six-sided) shape is, that not a particle of waste is thereby occasioned, as the sides of the hexagonals accurately fit into those of the adjoining biscuits; whereas circular pieces cut out of a large surface always leave vacant spaces between. That a flat sheet can be divided into hexagonal pieces without any waste of material, may be seen from the annexed cut. Each biscuit is stamped



with the king's mark, the number of the oven, &c., as well as punctured with holes, by the same movement which cuts it out of the piece of dough.

The hexagonal cutters do not sever the biscuits completely asunder; so that a whole sheet of them can be put into the oven at once on a large peel or shovel adapted for the purpose. About ten or twelve minutes are sufficient to bake them: they are then withdrawn, and broken asunder by the hand.

The corn for the biscuits is purchased at the markets, and cleaned, ground, and dressed at the government mills; in quality it is a mixture of fine flour and middlings, the bran and pollard being removed. The ovens for baking are of wrought-iron, with an area of about a hundred and sixty square feet. About 112 lbs. weight of biscuits are put into the oven at once; this is called a *suit*, and is reduced to about 100 lbs. by the baking. From twelve to sixteen *suits* can be baked in each oven every day, even by the hand process; but it is probable that the machine-made biscuits might be baked with much greater rapidity when required. The men engaged are dressed in clean check shirts, and white linen trowsers, apron, and cap; and every endeavour is made to observe the most scrupulous cleanliness.

We may now make a few remarks on the comparative

* Biscuits were originally "twice-baked;" hence the French and German names, "biscuit," and "zwei-back."

merits of the hand and the machine processes. If the meal and the water with which the biscuits are made be not thoroughly mixed up, there will be some parts moister than others. Now it was formerly found that the dough was not well mixed by the arms of the workman; the consequence of which was that the dry parts became burnt up, or else that the moist parts acquired a peculiar kind of hardness which the sailors called "flint:" these defects are now removed by the thorough mixing and kneading which the ingredients receive by the machine. We have said that 500 lbs. of dough is mixed by the machine in two minutes, and kneaded in four or five minutes; we need hardly say how much quicker this is than men's hands could effect it. The biscuits are cut out and stamped sixty at a time, instead of singly, and thrown into the oven a sheet at a time, instead of singly: besides the time thus saved, the biscuits become more equally baked, by the oven being more speedily filled. The nine ovens at Gosport used to employ 45 men to produce about 1500 lbs. of biscuit per hour: 16 men and boys will now produce, by the same number of ovens, 12,000 biscuits per hour.

The comparative expense is thus stated:—Under the old system, wages, and wear and tear of utensils, cost about 1*s.* 6*d.* per cwt. of biscuit: under the new system, the cost is 5*d.* The bakehouses at Deptford, Gosport, and Plymouth could produce seven or eight thousand tons of biscuits annually, at a saving of 12,000*l.* per annum from the cost under the old system. The advantages of machine-made over hand-made biscuits, therefore, are many:—quality, cleanliness, expedition, cheapness, and independence of government contractors.

DRUMMOND AND BUDE LIGHTS.—I.

Among the numerous subjects which have engaged the attention of ingenious men since the beginning of the present century, that of artificial illumination is not the least deserving of attention. *Oil*, supplied with a wick in order to separate it into minute streams, was probably, for thousands of years, almost the only means employed to procure light in the absence of the sun. At a later period, *candles*, made of a substance capable of yielding flame, came into use. The wax, spermaceti, tallow, &c., employed for their fabrication, however different in their nature, gave out light on precisely the same principles; the following being the steps of the process:—1. The heat applied to the wick melts a portion of the upper part of the tallow, &c., converting it into a kind of liquid oil. 2. This liquid ascends between the fibres of the wick in the same manner, and by the operation of the same principle, of capillary attraction, as water ascends through a lump of sugar. 3. The melted tallow, coming in contact with the flame, is converted into vapour, which ascends in the form of a cone; its temperature being sufficiently elevated to allow it to combine with the oxygen of the surrounding air; while the carbon, or charcoal, of the vapour is separated in a minutely divided state, and, being brought to a white heat, renders the flame much more luminous. The subject of combustion, or the combined production of light and heat, is beset with many difficulties, into which we purposely avoid entering here, and have contented ourselves with enumerating the more obvious steps in the conversion of solid tallow into luminous flame. Where oil lamps are used, all these steps, except of course the melting, occur; and they follow in the same order.

Such were the means employed for the production of light until the beginning of the present century, when a most important application of chemical knowledge was made. A piece of coal contains, among other elements, those which are met with in a tallow candle, although in different proportions, and combined in a different manner. We all know from experience, how often, in winter, a cheerful fire makes us forget that our candles are not yet lighted; and the light conduces quite as much as the heat to the satisfaction we feel: the flame thus produced being fully equal to that from a candle. These facts suggested the happy idea of decomposing coal into its component parts, of conveying the gases thus produced, after purification, from place to place, and of kindling them without the aid of any wick—constituting the modern gas-light. The history of this invention and the mode of proceeding are detailed in the 'Penny Magazine,' vol. iii., pp. 373, 427, &c.

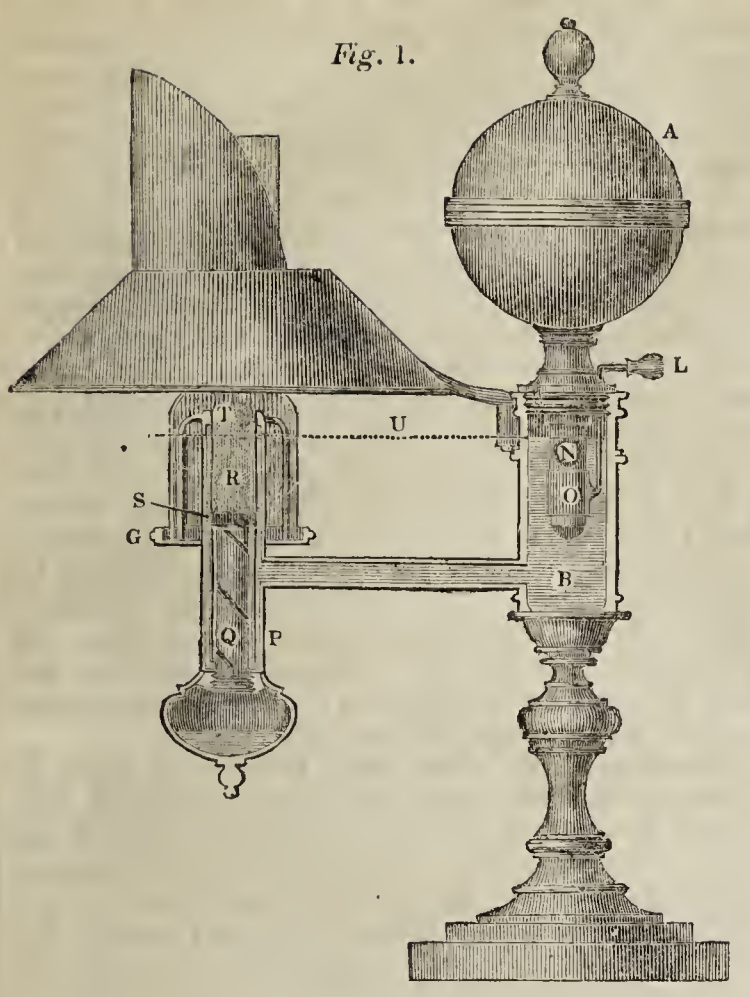
After the adoption of gas-lights in the public streets, the circumstance which seems to have contributed most to further inquiries on the subject was the necessity for an intense light in lighthouses. The principal object of those buildings, as is well known, is to point out to mariners the exact locality of some spots dangerous to navigation; and in order that this may be effected by night as well as by day, a strong light is indispensable. The old custom was to kindle large coal fires in the upper part of the lighthouse, and this plan was adopted at the Lizard Point as late as the year 1812. But this rude and wasteful system had been long before superseded at most lighthouses. The Eddystone, up to the year 1811, was lighted by twenty-four wax-candles; while at some other places an enormous lamp with a wick twelve inches broad was employed. To aid the illuminating power of these candles and lamps, polished reflectors, consisting of a number of facets, or flat surfaces, were placed behind them, so that the rays of light which issued in that direction should be reflected back, and directed seaward. But all these plans were laid aside some years ago for another in every way superior, namely, *Argand lamps* and *parabolic reflectors*—respecting each of which we shall say a few words.

The flame yielded by a common lamp or candle is superficial only; its centre being occupied by vapour not yet ignited. As a proof of this, we have seen a little cup of gunpowder held in the middle of the flame of a candle without being ignited. The reason of this is, that, in consequence of the form of the wick, no atmospheric air can reach the centre of the flame, and that therefore the combustion of the inflammable vapour cannot take place at that part. Now the Argand lamp (so named from its inventor) was a great improvement in this respect; for its wick being *hollow*, the lamp admitted of being so constructed as that a current of air could always pass up through the middle of the wick: and as the rising vapour was ignited both within and without, a more brilliant light was produced, and the quantity of smoke (which is actual waste of combustible matter) was diminished. This was the lamp in use in most of our London shops twenty or thirty years ago; as will be recognised from the annexed cut (*Fig.* 1): the reservoir of oil is above the level of the wick, and the latter has a hollow channel in the middle of the wick.

The *parabolic reflector* consists of two plates of silver and copper united by intense pressure, and then hammered out into that curved form called a paraboloid, of which the small end of an egg may afford a tolerable idea. The silver side being concave, and the light placed at or near the focus, a few inches in front of the centre of the concave surface, all the rays of light which fall on the paraboloid are reflected back, either in parallel rays, or diverging like a cone, according to the position of the lamp.

Such has been the principle adopted in nearly all our lighthouses. A parabolic reflector, from twenty to thirty inches in diameter, has a powerful Argand lamp in front of it, the illumination from which it so much augments, that the light at Beachy Head has been known to be visible at a distance of forty miles. As the reflected light does not diverge very widely, it is necessary to have several reflectors, with a lamp to each, in order to render it available for a wide circuit of sea. What is called a *revolving* light is

Fig. 1.



The reservoir A terminates in a neck, which screws into the upper part of the oil-cistern B; when it is unscrewed and inverted, the oil is poured into the reservoir at the hole N; by moving the handle L, the short tube O is made to cover this hole and prevent the oil from running out, and the reservoir is then screwed into its place, and the handle depressed so as to uncover the hole and to allow the passage of the oil into the cistern B. Within the perpendicular tube P there is placed a smaller tube Q, and both are closed at bottom and open at the top; the space between these contains oil and the wick R, stretched over the short tube S, rising a little above the tubes at T. The outer surface of the tube Q has a spiral groove formed round it, and a tooth in the ring or gallery G entering this groove, when it is turned round, causes the tube and wick attached to it to ascend or descend, so as to regulate the flame On account of the nature of the reservoir which contains the oil, a constant supply will be kept up at the level marked by the dotted line U, both in the cistern B and in the wick-tubes P and Q.

a contrivance by which the frame-work containing the lamps and reflectors revolves on a central axis once in a minute or more. The object of this is to prevent the light from the lighthouse being mistaken for the fire produced by any kiln, &c. on shore—a mistake which has sometimes led to the loss of shipping. Once or twice in every revolution the lamps of the revolving light are invisible at sea, and the identity of the lighthouse is thus recognised.

In the year 1824, the House of Commons determined on a new survey of Ireland, in which Lieutenant Drummond was to be engaged. Operations of this kind are conducted by parcelling out the country into very large triangles, the three angles or corners of which are frequently seventy or eighty miles distant from each other; and some means have to be adopted for making those stations visible at these great distances. Sometimes the light of the sun is reflected from a surface of polished tin; sometimes Bengal lights are fired at night; and at other times, a powerful Argand lamp is placed in front of a parabolic reflector, or behind a convex lens. Still something more powerful was required, and Lieutenant Drummond suggested the happy expedient of employing what is called the *Lime* light—a suggestion which had, we believe, also been made by Professor Hare and Mr. Gurney. As this lime light, or *Drummond* light, is one of considerable importance, we shall here explain the nature of it.

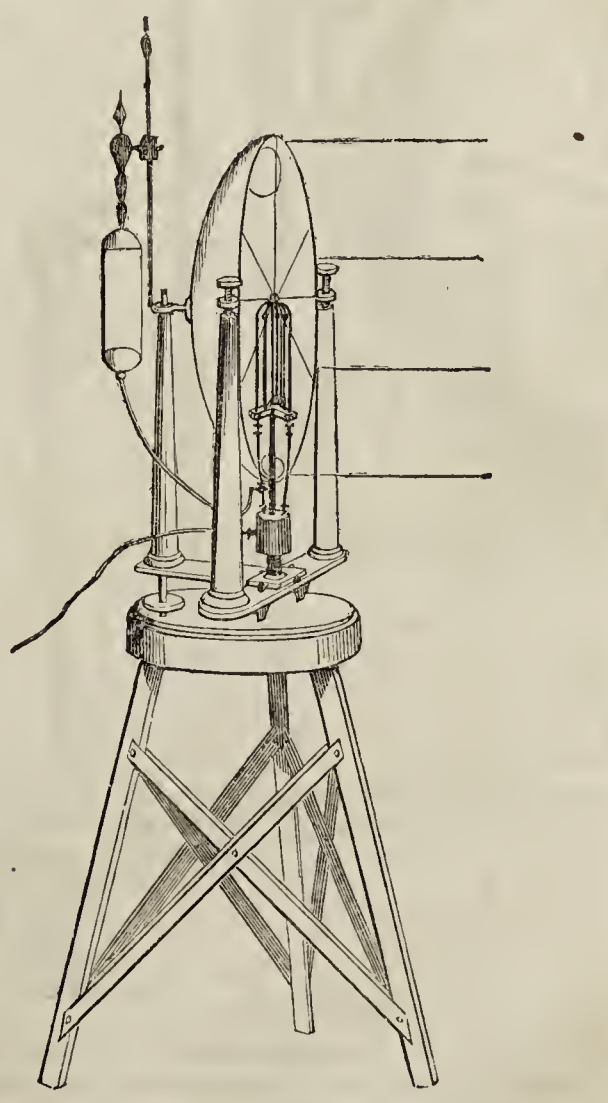
When some of the earths, such as lime, magnesia, &c., are exposed to intense heat, they become brilliantly luminous, to an extent that can scarcely be conceived by those who have not actually witnessed the experiment. Now, it has been long known that if a stream of oxygen gas be thrown in a jet on a flame produced from spirit of wine or alcohol, a very intense heat is produced. Lieut. Drummond accordingly selected different substances, such as lime, zirconia, magnesia, oxide of zinc, &c., and placed small pieces of them so that they might be acted upon by the flame of spirit, aided by a jet of oxygen gas. It was thus found that a little ball of lime, less than half an inch in diameter, afforded a light equal to that of thirty-seven Argand lamps: the other substances were less brilliant than lime.

These experiments were so satisfactory that an apparatus was speedily fitted up. A parabolic reflector was placed behind a small arrangement, in which a ball of lime was acted upon by a spirit flame and a jet of oxygen, so as to produce light which, when aided by reflection from the paraboloid, should be visible at a great distance.

In *Fig.* 2, is seen the reflector, with a little reservoir of spirit behind it, a lime-ball in the focus, and several jets passing up nearly close to the ball.

As an instance of the power of such a light as this, we may mention the following circumstance:—Two of the stations in the Irish survey were 67 miles asunder; one being a few miles from Londonderry, and the other near Belfast. From August 23rd till October 26th, Colonel Colby and the other officers engaged were totally unable to see at one station an elevated object erected on the other, on account of the intervening haze. It was therefore proposed to try the lime light; and after much difficulty, on account of tempestuous weather and the exposed situation of the hill, the apparatus was brought

Fig. 2.



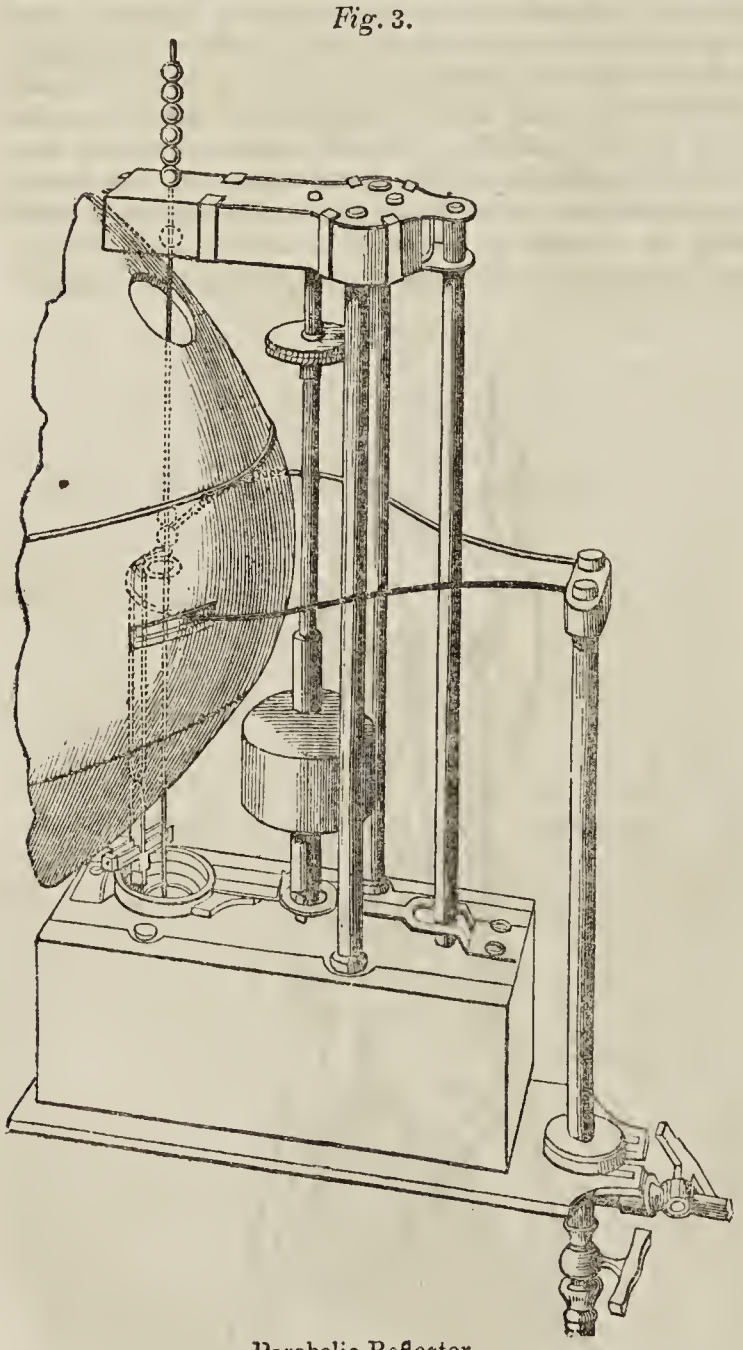
Lieut. Drummond's Light.

into action; and the light produced was instantly seen by the officers at the Belfast station. It is not a little calculated to excite surprise that a piece of lime not

larger than a boy's marble should, when exposed to the action of a flame which in itself is scarcely luminous enough to read by, yield a light capable of being seen 67 miles off; a distance almost equal to that from London to Portsmouth!

In 1826, Lieut. Drummond communicated the result above noticed to the Royal Society, and at the same time suggested that the same light might possibly be available for lighthouses. Shortly after this, a proposal was made by the Brethren of the Trinity House (in whom the management of most British lighthouses is vested) that a series of experiments should be made on the availability of the lime light for such purposes. Such experiments were accordingly made; and they are described in the 'Philosophical Transactions' for 1830. The intense heat before applied to the lime was, as we have said, obtained by directing a stream of oxygen gas through a flame of spirit of wine. But although the necessary apparatus was very portable, it was rather too costly for a perpetual light, such as is required in a lighthouse. It was therefore resolved by Lieut. Drummond to substitute hydrogen gas for spirit of wine, and the result was highly successful. The arrangement of the apparatus was this:—The two gases, oxygen and hydrogen, were prepared by chemical processes, and kept in two gasometers. From these gasometers pipes conveyed the respective gases to a small

Fig. 3.



Parabolic Reflector.

reservoir, where the two gases united. The united gases then passed through wire-gauze screens, and through a very fine tube in two branches, and issued directly upon a ball of lime placed between the ends of the tubes. The greater part of the apparatus was placed behind a parabolic reflector, but the lime-ball and the fine tube were in front of it, and in the focus of the curve.

In order to compare the light produced by such an arrangement with others previously known, a temporary revolving lighthouse was erected on a hill at Purfleet, so as to be visible at Trinity wharf, Blackwall, ten miles and a quarter distant. This lighthouse had four sides or faces, which were provided with lights of different kinds:—in the 1st was an Argand lamp before a parabolic reflector; in the 2nd were seven lamps and seven reflectors; in the 3rd was a powerful lamp with a convex lens before it; in the 4th was the lime light. Lieut. Drummond superintended the experiments at Purfleet, and Captain Basil Hall observed the effects at Blackwall. The Argand lamp produced a small but good light:—the seven Argand lamps produced a light of the same character, but obviously more brilliant:—the lamp behind a lens produced a light whiter and more intense than the seven reflected lamps:—the last of the four, that is, the lime or Drummond light, greatly surpassed all the others in vividness and brilliant whiteness; indeed a distinct shadow was thrown by it of the hand and fingers against a brick wall. The Drummond light was then exhibited in company with each of the others in succession; when its comparative intensity was rendered still more obvious.

The experiments which Lieut. Drummond made, led him to the conclusion that the absolute quantity of light emitted by a ball of lime three-eighths of an inch in diameter, is equal to that from thirteen Argand burners; while the *intensity* of the light at any one given spot is in the lime-ball 264 times that of the Argand burner.

[To be continued.]

THE ORKNEY ISLANDS.

The Orkney Islands are a group of islands belonging to Great Britain. They are situated north of the north-eastern extremity of Scotland, between 58° 44′ and 59° 24′ N. lat., and between 2° 22′ and 3° 25′ W. long. They are divided from the mainland of Great Britain by the Pentland Frith, which is 5½ miles wide at its eastern entrance between Duncansby Head and Borough Point in the island of South Ronaldsha. The flux and reflux of the water during the run of the tides through this strait is broken by the Pentland Skerries, which lie a little more than 4 miles to the north-east of Duncansby Head, and 2½ miles south of the island of South Ronaldsha; and farther westward by the islands of Swona and Stroma, the latter of which lies within 1½ mile of the shore of Caithness. A strong current is thus produced running at the rate of from three to nine miles an hour in various parts of the Frith at one and the same time; a circumstance which causes so much sea in gales of wind as to render the strait very dangerous to deep-laden vessels. There are two lighthouses erected on the Great Pentland Skerry, and another on Dunnet Head, on the south side of the western entry to the Frith, with the assistance of which the strait may be navigated with comparative safety in moderate weather.

The group consists of 67 islands and islets, 27 of which are inhabited; the remainder, called *holmes*, are only visited during the summer for the preparation of kelp or as pasture-grounds. The largest of these islands, called Pomona, or Mainland, extends from south-east to north-west, about 18 miles, and divides the group into two portions. The islands between Pomona and the mainland of Great Britain are called the South Isles, and those north of Pomona, the North Isles. Eight of the South Islands and three Skerries and fifteen of the North Isles are permanently inhabited. They contained in 1831 a population of 28,847, viz.:—

South Isles.	Inh.
Swona and Pentland Skerry .	89
South Ronaldsha . . .	2,265
Burra	357
Flota and Fara . . .	369

	Inh.
South Isles.	
Hoy	1,388
Gremsay	225
Copinshay	7
Pomona, or Mainland	15,787
Hunda	5
North Isles.	
Shapinsha	809
Gairsa	69
Weir	93
Egilsha	228
Rousa	921
Enhallow	20
Eda and Fara	756
Stronsa, Papa Stronsa, and Lingholm	1,071
Sanda	1,839
North Ronaldsha	522
Papa Westra	330
Westra	1,702
	28,847

Some of the islands have rocky shores presenting abrupt precipices towards the west, and rise in low rounded hills covered with heath, and with a considerable depth of peat-mould. Others are low and flat, with sandy shores. There are no trees on any of the islands, with the exception of a few of small size in the neighbourhood of the town of Kirkwall, although at some remote period they would appear to have been covered with wood, from the numerous remains found imbedded in the peat mosses.

The geological character of these islands is very simple; the whole group, with the exception of a small granitic district near Stromness, consisting of rocks belonging to the old red-sandstone formation. The prevailing rock is a species of sandstone flag, much charged with argillaceous matter. It occurs in distinct strata, usually slightly inclined, forming hills of small elevation inland, which however often present very magnificent cliffs round the coasts. The colour varies from pale greenish to blackish grey. Occasionally it contains bitumen, and it is the repository of remarkable fossil fishes.

Connected with the sandstone flag are beds of common sandstone of a yellowish or tile-red colour. It forms the chief part of the mountains of Hoy, the highest point in Orkney, and also several headlands in Pomona and Eda. Dykes of basalt and greenstone traverse these rocks in Hoy, Pomona, &c., and a bed of basalt was noticed by Dr. Traill in Hoy.

The granite tract appears in the form of a chain of moderate hills, occupying a length of six miles, and a breadth of from one to half a mile, and ends at Stromness. It is everywhere in immediate contact with a coarse conglomerate, consisting of nodules of quartz, and fragments of granite and sandstone, imbedded in an arenaceous base. The granite, conglomerate, and sandstone flag, above noticed, strikingly resemble the corresponding rocks in Caithness and Sutherland. Fossil fishes occur rather plentifully in Pomona, in the lower beds of a quarry of sandstone flag. The fishes from Caithness and Orkney approach one another very nearly, but among the latter are several new species and even genera. Two of the most remarkable are named, by Agassiz, Cheiracanthus and Cheirolepis. (Traill and Agassiz, *Reports of the British Association, for* 1834.)

According to a rough estimate, the surface of the islands is 150,000 acres, of which less than one-third is cultivated and used as pasture; the remainder is a waste or covered with water. The island of Sanda, which is flat and low, is the most fertile, and accordingly is called the granary of the Orkneys. Wart Hill, on the island of Hoy, has an elevation of 1556 feet, and is considered the highest land in the islands; Wideford Hill on Pomona also rises to a considerable elevation. The coasts of Pomona and the South Isles are very irregular in their outline, and contain several secure and spacious harbours.

As the Orkneys lie open to the wide expanse of the Atlantic, and are exposed to the western gales, which are the prevalent winds, the climate is rather wet than cold. Frost rarely continues for several days in succession, and the harbours are open all the year round. The winter is disagreeable on account of the frequent rains, sleet, and storms, and it is usually prolonged far into the spring, which season also is very damp. The summer is generally fine and pleasant, the heat being very moderate and the weather steady. The early part of the autumn is likewise agreeable, but in November the bad weather commences.

The soil of some of the islands is of inferior quality, but that of others is excellent. Agriculture is limited to the raising of oats, and that kind of barley which in Scotland is called bear, or big, and to the cultivation of potatoes, turnips, and a few other vegetables. Owing to the proprietors having turned their attention for many years exclusively to the kelp manufacture, agriculture has been greatly neglected; but of late great improvements have taken place, and the opening of a regular steam communication with Aberdeen and Edinburgh has given a great stimulus to the raising of green crops and rearing of cattle, for which the islands are peculiarly adapted. Owing to the wetness of the climate and the lateness of the summer, wheat is not found to answer, but oats, barley, and big or bear, are exported in considerable quantities. Cattle are numerous, but small: on several of the larger farms the Angus and short-horned breeds have been introduced with success. Horses are abundant, but small. Sea-fowl abound on most of the smaller islands. Many families subsist entirely on the produce of their fishing; cod, herrings, and lobsters abound along the coast, and seals are common. It has been conjectured that the islands derive their name from the seal, *orc*, in the language of the Northmen, signifying a seal. A few years ago the inhabitants derived a great profit from the preparation of kelp. But for the last five or six years the manufacture has been almost extinct, the article having been quite superseded in the soap and glass works by the carbonate of soda made from common salt. During the war the price of kelp has been so high as 20*l.* a ton, and for many years it was never below 12*l.* Latterly it has sold for about 3*l.* or 4*l.* a ton, which hardly pays the labour of making it and sending to market. The little kelp which is still made is used chiefly in the preparation of iodine. Owing to the extinction of the kelp manufacture, a complete change has taken place in these islands. Under the old system the mass of the population were, in all but name, serfs attached to the soil, being bound to labour at kelp-making for the landlord in exchange for a miserable cottage and little patch of land, and living from year to year without hope or prospect of bettering their condition. The failure of the market for kelp in fact emancipated them, as their labour ceasing to be valuable to the landlord, they were left at liberty to employ it in any occupation which they found most advantageous. The consequence has been a great extension of agriculture, and the rise of the herring-fishery, which had been entirely neglected, into a branch of industry of great importance. Upwards of 700 boats, with six men each, and of the average value, with their nets, of 130*l.* or 140*l.*, are now employed in this fishery, and the number is rapidly increasing. In favourable years from 30,000 to 50,000 barrels of herrings are exported, and from 20,000*l.* to 30,000*l.* are divided among the fishermen and their families. The cod-fishery also, which is prosecuted in the months of May and June, before the great shoals of herrings appear on the coast, is

fast rising into importance, and already brings from 5000*l.* to 7000*l.* annually into the country. The lobster-fishery is also carried on, but is of minor importance.

The inhabitants are of Scotch and partly of Norwegian descent. While the islands belonged to Norway and Denmark, many Norwegians settled on them, and their language was exclusively in use. But since the islands have been annexed to Scotland, a great change has taken place, and the Norse language has been long extinct. A few relics of the Udal tenure, the universal tenure of land among the free nations of the north, may still be found; and there are instances of families who occupy small patches of ground which have descended from father to son from time immemorial. In character, manners, and language, the inhabitants of those islands now differ little from the Scotch lowlanders. They are generally intelligent, educated, and moral. The competition between the United Seceders, who constitute about a third part of the population, and the established church, has done much of late years to extend the means of education and diffuse a spirit of religious zeal. There are few parishes which have not at least two schools. The women find some occupation in straw-platting. A number of young men leave the country to enter the merchant navy, and often rise to be masters and mates of vessels, being in general sober, honest, and able to read and write. Formerly a considerable number went to America in the service of the Hudson's Bay Company, but since the junction of the Hudson's Bay Company with the North-West Company, Canadians have been exclusively employed. A few men also go every year with the whale-ships to Davis's Straits, but, owing to the rapid increase of the herring and cod fisheries of late years, the number who leave the islands in search of employment is considerably diminished.

It appears that the Orkneys were early taken possession of by the Normans, and they remained subject to the kings of Norway and Denmark till the year 1468, but had their own kings or earls, who governed them as independent sovereigns. The Orkneys were the general rendezvous of the piratical fleets which so often devastated the coasts of England and France. Rollo, the conqueror of Normandy, and ancestor of William the Conqueror, was an earl of Orkney. In 1468 the islands were pawned to Scotland for 50,000 florins, and the pledge has never been redeemed. From the year 1471 the earls of the island became dependent on Scotland, and from that time were considered like other chieftains of the Scottish clans.

Kirkwall, situated on a bay on the north coast of Pomona, is the capital of the islands. The cathedral of St. Magnus at Kirkwall is one of the most remarkable specimens of middle age architecture in Scotland; it was built by Olave, king of Denmark. It is in good repair and still used as the parish church. Close to the cathedral are the ruins of the bishop's palace, and of the palace of Earl Patrick Stewart, the last feudal earl of Orkney, who was executed for high treason in the reign of James I. The town consists of one long narrow street, but contains several good houses and shops. It has been recently lighted with gas. The population in 1831 was 3721. It has ten schools, and a considerable trade in the produce of the island. In 1835, 78 vessels, of 4238 tons, navigated by 326 seamen, belonged to this port. In 1834 the shipping which left the port amounted to 8248 tons, and 10,304 tons entered. The town has some distilleries.

Stromness, situated towards the south-western extremity of Pomona, has also a good harbour. It contained in 1831 a population of 2521, and it has considerable trade: about 300 vessels annually enter the harbour.

Though there are several other good harbours, they are not used, except by fishing-boats; the best in Orkney is Inganes Bay for all classes of vessels. The principal stations for the herring-fishery are St. Margaret's Hope in South Ronaldsha and Strenzie in Stronsa. On the island of Hoy there is an excellent and spacious harbour, called Long Hope. The stewartry of Orkney and Shetland, consisting of this group and the Shetland Isles, sends one member to parliament, and the town of Kirkwall, which is a royal borough, returns a member together with Wick, Dingwall, Tain, Cromarty, and Dornoch.

Improvement of Corn and Grain.—Might not the cultivation of the various kinds of grain purposely for seed be more generally practised, and form a distinct branch of agriculture? And would not this be well adapted to small occupiers, and cottagers who may have had allotments of land given or let to them to enable them to live by their own labour and industry without parochial relief? Thus the good qualities of any grain (chevalier barley, &c. &c.) might be perpetuated, new varieties might be produced, and the defects corrected by cultivation, as is the case with horticultural plants.—*Penny Cyclopædia.*

Primitive Corn-Mill of Upper California.—These mills consist of an upright axle, to the lower end of which is fixed a horizontal water-wheel placed under the building, and to the upper end the mill-stone; and as there is no intermediate machinery to increase the velocity, it is evident that the mill-stone can make only the same number of revolutions as the water-wheel. This makes it necessary that the wheel should be of very small diameter, otherwise no power of water thrown upon it could make it go at a rate sufficient to give the mill-stone the requisite velocity. A set of what is called cucharas (spoons) are stuck into the periphery of the wheel, which serve in place of float-boards. They are made of pieces of timber in something of the shape of spoons, the handles being inserted into mortices on the edge of the wheel, and the bowls of the spoons made to receive the water, which spouts on them laterally, and forces round the small wheel with nearly the whole velocity of the water which impinges upon it. This mill is erected at a very small expense.—*Forbes's California.*

The Past and the Future to the Freeman and the Slave.—Freemen have a love for the past and an anticipation of the future. Brought up by the tender care of their own parents, they are immediately connected with the generation before them; rearing up their own children with equal care, they are connected no less with the generation that to follow them. And as every generation of freemen is so linked with the one before and after it;—and as they have works of their hands and much more of their minds, which live through many generations, so freemen are, as becomes them, "Beings of large discourse, looking before and after." What is ancient is not so much distant from them as consecrated to their minds by having been known and loved by so many of their fathers in so many ages;—what is remote in futurity is that high blessing, to which, if they forfeit not a freeman's privileges, their children, helped by their care and institutions, may one day be enabled to attain. But how is it with the slave? Alas! in the stern but true language of law, he is "nullius filius," the son of nobody; he has no parent and can have no children. What is the past to him, or what the future, so far as earth is concerned, more than to the beasts? Ancient buildings, ancient birth, ancient usages, ancient laws, are to him but words without a meaning. All behind him is a blank, and so is all before him. And thus when we hear men talk with indifference or with hatred of all our best institutions,—when we find them perfectly ignorant and careless of history,—and as incapable of carrying forward their view beyond the immediate present,—we see the certain marks of slaves,—we hear a language which, in all but slaves, is insanity.

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NEWCASTLE IMPROVEMENTS.—No. II.

[Royal Arcade.]

Richard Grainger was born in 1798, in High Friar Chase, Newcastle-upon-Tyne. His father was a porter employed on the quay. His mother, a native of Gibraltar, earned a subsistence for her children, after her husband's death, by stocking-grafting, glove-making, and clear-starching. At the time of the birth of Richard, the third son, the family lived in two small rooms: the only prospect of education for the children was from the charity-schools of the town. Richard had no other schooling than what he got at the parish charity-school of St. Andrews, whose course of study was comprised in the Bible, Tinwell's 'Arithmetic,' 'Tom Thumb,' and a spelling-book. Some of the inhabitants of Newcastle can recal the appearance of the boy in those days in his green badge-coat, with his round, ruddy, smiling face, and his quiet manner. He was then remarkable for nothing but his serenity, his characteristic through life. He now looks back with great affection to his school-days, and likes to speak of his humble home, and the companions with whom, from his easy temper, he was always on good terms.

When he was twelve years old a change of importance took place in the town. The shambles had been till then in the open street. At that time a commodious covered market was erected in the Dean, in a low but central situation, at a cost to the corporation of 17,000*l*. This improvement seems to have struck his mind.

He was also early impressed with the inconvenience occasioned to the inhabitants of the town by a great space in the centre being wholly useless for purposes of communication, and the principal streets being therefore widely circuitous. North of the High Bridge, where the Dean widened, leaving a space of twelve acres, there had been a convent of Franciscan Friars, and the nunnery mentioned before, with the holy well. This space was, in Grainger's youth, occupied by an old mansion (once the prison-house of Charles I.), surrounded by gardens and plantations, which were rendered unproductive by the smoke of the surrounding town. This extent of twelve acres, serving no purpose of either use or ornament, early interested Grainger's imagination as the scene of vast future improvements; and he hoped the day might come when it would be in the hands of some one who would sell it. That time arrived, as we shall see, when he himself was able to be the purchaser. Meanwhile he saw in vision, as he now declares, the new town as it has arisen under his hands—terraces, squares, long ranges of streets, all fronted with polished stone, instead of the peculiarly ugly brick of which the old town was built. He noted the extent of the quarries in the neighbourhood, and the quality of the stone, and rightly concluded that the prejudices which had hitherto interfered with the use of this abundant natural treasure were unfounded.

All these thoughts occupied his mind during his apprenticeship. His master was a house-carpenter and builder, of the name of Brown, who has since been employed as a journeyman on some of his pupil's erections. Grainger won some attention at this time by the remarkable steadiness and easy composure of his character, giving promise of respectability and indications of power of mind. He belonged to the Methodist body, and was pointed out to Mr. Fenwick, who was afterwards his

attorney, as a fit person to be employed in collecting the monies of the Tract Society. He brought in the subscriptions weekly with entire regularity; and Mrs. Fenwick, seeing him on one of these occasions, asked who he was, saying that she had "never seen such a bonny lad."

When he was out of his time, his elder brother, George, who was a bricklayer, engaged him to join in an enterprise of his own, pulling down and rebuilding a small house next their mother's, in High Friar Chase. This humble abode is now an object of some curiosity as the first work of Richard's hands after beginning business on his own account. This brother George fell ill, and became incapable of business many years ago, and then died, or, it is possible, his name might have risen with his brother's.

Mr. Batson, an opulent member of the religious society to which Richard Grainger belonged, became early interested in him, and afforded him the first opportunity of distinguishing himself. Mr. Batson was employing some of his capital in the erection of Higham Place when Grainger set up for himself, and he employed the young man to build some of the houses. The older builders, who were engaged in other parts of the new erections, laughed to scorn the idea of the proprietor employing "a raw lad like Grainger." Grainger, however, did his work thoroughly well. He gave his whole mind to it, rising at three or four in the morning, and working till nine at night.

Soon after, Grainger married well. At class-meetings he had become acquainted with Rachel Arundale, and they became attached, and married. She has been an excellent wife, aiding him not only by providing him the asylum of a comfortable home, but by the goodness of her taste, and by her talents for business. She has assisted him throughout his years of enterprise by managing his accounts and conducting his correspondence. She had a fortune of 5000*l*.

The first undertaking which Grainger entered into from his own resources was building two houses in Percy Street. Then he erected nearly the whole of the east side of Carliol Street, a part of New Bridge Street, and the whole of Blackett Street, except eight houses. This street, not planned by him, was considered a grand affair at the time of its erection, from its width and regularity, though the houses are of brick, and have no pretensions to architectural beauty.

From these works, Grainger now proceeded to a more ambitious enterprise,—the erection of Eldon Square. Blackett Street runs along one side of this square. The other three sides are composed of handsome stone houses, of a solid, plain, uniform style of architecture, the corner houses next Blackett Street and the Clubhouse in the centre projecting, and showing somewhat more ornament than the rest. The whole was Grainger's work, with the exception of four houses. The speculation was so successful as to enable him to proceed to yet larger enterprises. Eldon Square was begun in 1826.

Mr. Grainger next opened to Mr. Fenwick, his friend and attorney, a scheme for erecting the Leazes Terrace and Crescent, containing together seventy first-class and sixty second-class houses, with polished stone fronts, more highly ornamental than anything that had yet been seen in the town. His friend, alarmed by the extent of the speculation, advised him to retire upon the 20,000*l*. he had now realised, instead of risking all in so vast an enterprise. Grainger received the remonstrance with his usual placidity, and proceeded to exhibit his calculations. Nothing could be more perfect. There was not a risk left unconsidered. He satisfied his friend of the prudence of the undertaking, built the Terrace and the Crescent, and was enriched by them.

The Leazes are a wide grazing-ground to the north of the town, adjoining the moor. The ground is high, and the situation of the terrace open and airy. It consists of a block of seventy lofty houses, in form an oblong square, and surrounded by a paved terrace walk on the outside of the small gardens in front of the houses. It is deservedly the pride of the town, even now, since the creation of what is commonly called "the new town." So much has to be said of these later improvements, that we abstain from entering into details of the architectural character of any of Grainger's erections prior to 1834. All that he did before that time may be considered as merely introductory to the great work of his life.

One other enterprise only remains to be mentioned as belonging to this early stage of his career,—the Arcade,—perhaps the least successful of his works, though he has lost neither credit nor money by it. The corn-merchants of Newcastle were greatly in want of a Corn-exchange, and there had been much planning and some action about erecting one in front of St. Nicholas church. After dragging on for a long time, the affair came to a stand, and the corn-merchants requested Grainger to provide them a place to meet in. He began to build for the purpose in Pilgrim Street. As soon as this was known, the projectors of the other Corn-exchange bestirred themselves again, and Grainger was obliged to alter the destination of his building. He desired to concentrate as many public offices as possible on this spot, and to make of the remaining part a sort of inn of court, a collection of all the lawyers' offices in the town. In this he has partly succeeded, but only partially, from the Arcade not being a necessary thoroughfare, one end only opening into a busy part of the town. In the Arcade, however, are the Post-Office, the Stamp, Excise, and Permit Offices, the Savings' Bank, the North of England Joint-Stock Bank, and many lawyers, engineers, and architects' offices, some auction-rooms, and shops.

The handsome stone front, occupied by the two banks, is 94 feet long and 75 feet in height. The interior, lighted by eight conical glass domes, is 250 feet long, 20 feet wide, and 35 feet high. This pile of building was begun in June, 1831, and opened in May, 1832. The entire cost is stated by Mr. Grainger to be 40,000*l*.

Already, before beginning his "new town," Mr. Grainger had enriched his native place with property of the value of nearly 200,000*l*., viz.:—

Early erections, worth . . .	£45,000
Eldon Square	30,000
Leazes Terrace and neighbourhood .	80,000
Royal Arcade	40,000
	195,000

The town now began sensibly to feel the effects of Grainger's activity in the rise of a large body of prosperous artisans, in the importation of Baltic timber, and the increased demand for dwelling-houses, shops, and warehouses, which kept the other builders of the place busier than they were before their great townsman arose. All that we have related, however, was but the beginning of Grainger's achievements.

[To be continued.]

CHIVA.

The Khanate of Chiva, in its original dimensions, scarcely exceeds seventy miles from east to west, and one hundred and twenty from north to south: it is situated south of Lake Aral, and encompassed by deserts or steppes, one of which, that of Gasnak, separates it from Bokhara on the east and south-east; while on the south-west and west it has Turcomania, or the wild regions inhabited by the Turcomans, for its neighbour. The banks of the Amu-Derja, or Oxus, form the greater part of its north-eastern frontier. But the Khan-

atc in its present extent embraces many surrounding districts, such as portions of Persia, Bokhara, and Turkomania, which fear or conquest have rendered partly subject and partly tributary to it. The Amu-Derja is its only river; it comes down from the mountains north of India, traverses Bokhara, and skirting Chiva, flows into Lake Aral, where it closes a course of twelve hundred miles, after fertilising the several countries which lie upon its banks. It is the great aliment of the agricultural prosperity of Chiva, the surface of which, like that of its Bokharian neighbour, is intersected by natural or artificial canals, many of which are of considerable breadth (above thirty feet), and constructed with much skill upon solid embankments, with here and there an aqueduct to lead the waters across lower lines of canals which run in contrary directions. The soil produces grain, fruit, and other vegetable crops in superabundance, besides two plants, the Kundjut, whence oil is extracted, and the Djogan, on which the horses are fed. The people graze large herds and flocks of camels, oxen, and sheep, the latter of which attain a great size. Their horses are remarkably strong, performing a distance of eight days' journey at the rate of eighty miles a day, and frequently pass whole days without drinking, and with no food but five or six handfuls of djogan during the four and twenty hours. The principal wild animals are the jackal, wolf, and fox, the eagle, stag, and djeran, which is a species of antelope. There is a chain of mountains in the eastern districts called the "Cheki-Djeri," which extend to the shore of Lake Aral northwards, and is said to contain rich mines of silver, copper, lead, and sulphur; the copper and lead are however the only metals which the Chivans raise. The climate is represented as being temperate and healthy, with little rain or snow, and a short winter.

The number of inhabitants is variously estimated; by some travellers at 350,000, and by others at 500,000; they are of various races, at the head of which stand the "Uzbegs" (or independents), the conquerors of the country, and its despotic rulers, as the Mandshoos are in China. The one, like the other, hold the natives in utter contempt and servitude; indolent and intractable at home, but active and indefatigable where an opportunity is afforded them of indulging their predatory predilections; and proud of their warlike ancestry, from whom they have probably inherited their constant boast—"We live by our arms and our bravery." Their leading characteristic is frankness, and scorn of deceit and lying. The "Sarty," or "Padshiks," who are the aboriginal people of Chiva, chiefly dwell in the towns, and devote themselves especially to the pursuits of trade; they are a cunning, treacherous, and cowardly race of men, and addicted to gambling and drinking, in which their general affluence enables them freely to indulge. The "Kara-Kalpaks," in number about 100,000, form the agricultural portion of the community, and are in great indigence, as well as cruelly oppressed by both Uzbeg and Padshik; they travel about the country in quest of a livelihood, and would prove formidable allies to an invader who would deliver them from their masters' yoke. In addition to the three preceding classes, there are about 30,000 Persian and from 2000 to 3000 Russian captives (6000, according to the Russian accounts), who drag out a miserable existence among the Chivians. The Turkoman tributaries, a roving race, must also be numbered among the Khan's subjects.

There are 75 towns and villages in the country; the former, five in number, consist of Chiva, surrounded by a wall of earth, and defended by a massive round-shaped citadel, but of slate-clay, on the Amu-Derja, with 5000 inhabitants, where the Khan resides; New-Urgendshe, or Orgundsh, to the north of Chiva, with 10,000; both are places of considerable trade. In the south are Chezarist; in the north, near the westernmost mouth of the Amu-Derja, Churat; and on the Caspian Sea, Mangishlank, situated on the peninsula of that name, which is frequented by the Russian merchantmen.

Its last sovereign, Mohammed Rahim Khan, who figures in Russian despatches under the designation of "sovereign highness," and "Mighty Lord of the regions of the East," inherited the sovereignty in 1802; he was a prince of distinguished talent and gigantic stature—another Barbarossa; for his red beard, according to Eastern convictions, not merely entitled him to the name, but was an appendage symbolical among them for prowess and capacity. Chiva was an insignificant state when this man came to rule over it; but wading through all kinds of cruelties, of which the extinction of every relative and rival was not the least, putting an end to the power of the leading Uzbeg families, who had reduced the authority of his predecessors to a mere shadow, and waging successful war, with the aid of his Turkman and Kirgisian allies, against Persia and Bokhara, he raised his dominions to a pitch of ascendancy which they had not enjoyed for centuries before. A vigorous and discreet organization of his internal resources powerfully seconded his ambitious views, which were, however, arrested by the hand of death in the year 1826. Of his successor, Alla Khul Khan, it is enough to say that he inherited his territory with little of the ability by which it had been rendered extensive and formidable.

Alla Khul, the reigning khan, now in his 45th year, is a peaceably disposed and gentle-hearted character, for whom neither hunting, foraging, nor cruelties have any charm; in fact he is very severe towards all plunderers and thieves, and for this reason not only is he unpopular among his Uzbeg and Turkoman liege, but was disinherited by his father, who endeavoured, but without effect, to secure the succession to his second son, Rahman Khul. The latter, to whom the oligarchs of the country are much attached on account of his warlike and freebooting propensities, retired to Chezarist upon Alla Khul's accession, threw off all subjection to him, collected tribute from the surrounding districts, and is said to have joined the Russian expedition against his brother.

Alla Khul resides in the citadel of Chiva, is attended by a troup of fifteen guards, and wears a bent sabre at his side as his constant companion. His troops are said to amount to 20,000 men, all mounted; the private, on his departure for a campaign, receives 25 ducats (about nine pounds sterling), one-half in bread, and the remainder in money; besides forage and meal while in the field. Their baggage, ammunition, &c. are borne on camels' backs. The officers, or Jusboshi, receive from 40 to 70 ducats each, according to their rank, independently of provisions: and it is his special duty to see the horses kept in good condition. One-half of the spoils of war belong to the khan; and the prospect of enjoying the other half induces numbers of volunteers to join every marauding expedition: a part of them consists in the heads and ears of their enemies, the khan paying them ten ducats for the former and five for the latter. Their arms are swords and lances, and here and there a firelock, to which the Turkomans add a long knife; the leaders wear coats of mail, and the few firelocks seen among them are a distinction peculiar to the Uzbeg nobles, who have them made in the country, and receive their ball and powder from Chiva, where it is manufactured and preserved in chambers of brick. The ordnance of the whole khannate does not exceed fifteen pieces, cast by Russian prisoners, and mounted on carriages also constructed by them, but unfit for almost any service. Cannon balls are also cast in Chiva, but the use of cartridges seems to be unknown. Although the khan possesses a revenue of more than one hundred thousand pounds, which would enable him to increase his forces considerably, his soldiery are totally unfit to contend against the most insignificant regular troops accustomed to European discipline and warfare.

The principal object which the khan has in view in his foreign inroads is the capture of slaves; these hapless beings are condemned to the hardest labours, with the exception of those who are Sunnites, that is, of the same sect of the Mohammedan religion as the Chivans; these more fortunate captives are placed in their ranks. As the natives never submit to any heavy work, whether in their fields or gardens, they force their prisoners to do it; indeed the Chivan is not only indisposed to, but so ignorant of, agriculture or horticulture, that if they had no Kara-Kalpaks, Russians, Persians, or Calmucks amongst them, it seems probable that they would die of sheer starvation. In aggravation of the severity of their toil, the captives are doomed to scanty nourishment; even the khan himself allows his own slaves no more than at the rate of 120 pounds of meal per month, out of which they must wholly feed and clothe themselves. The prisoners on their arrival are conducted to Chiva, where they are sold like beasts in the open bazaar, at the rate of 60 to 70 ducats per head (about twenty-four to twenty-seven pounds sterling) if in the prime of life and health. These slaves manufacture all the articles of clothing, &c. which the natives require; among others, cottons and silks, camlets, felt, and carpets, copperware, &c. The trade with Russia is considerable, and carried on by caravans, which, even in time of war, are allowed to travel unmolested; and next in value is the trade with Bokhara.

The form of government is despotic in its worst sense; for the council, who assist the khan in judicial and some few other matters, are relentless oligarchs, infinitely more tyrannical than the tyrant whose will is here the only law. The punishments inflicted for offences are exceedingly severe; empaling, which the offender often survives for two whole days, is an ordinary penalty, and burying alive, the offender being compelled to dig his own grave, is not of uncommon occurrence.

The female sex in Chiva lead a wretched life; their husbands exercise the most rigid mastery over them, and they have no mercy to expect at their hands if even a semblance of infidelity can be brought home to them. Their fare is of the scantiest, and the daily allowance even to the khan's wives is weighed out to them. His household has each day for its subsistence 120 pounds of wheat meal, eighty of rice, forty of flesh, and twenty of hard butter. So rigid indeed is the system pursued, that the very ladies of the prince are frequently obliged to sell the remains of their meals in the bazaar in order to obtain wherewith to buy silk or other necessaries. The khan's kitchen is besieged twice a day by the people of the household, who bear away the prescribed rations for officers, females, and servants, in earthen vessels. The largest of these rations is laid before the khan himself, and much of it remains unconsumed; but what is left makes a subsequent meal for his ministers and household officers, who may be seen dancing eager attendance for it in the antechamber, where the scramble for their prince's "leavings" occasions scenes savouring little of courtly refinement.

The khaness, Alla Khul's eldest wife, is a Kirghisian princess, and from her consort's quiet pliable character, no less than her own violent temper, exercises uncontrolled sway over him. All her domestics are captives, and kept in good order by a thong, in the use of which she is no mean adept.—*Helmersen's Report; Letters of an Officer on the Expedition*, 1839; *Muravief's Journal, &c.*

Ploughing in Upper California.—From the construction of the plough, there being no mould-board or feathered shear, the furrow cannot be cut up and turned over as with an English plough, a rut only being made; consequently the soil can only be broken by successively crossing and re-crossing the field many times; and it is evident that however often crossed by a machine of this kind, the root weeds of any tenacity can never be cut, so that this mode of ploughing must always be very imperfect. The necessity of giving so many crossings is a great waste of labour. It is no uncommon thing to see on the large maize estates in some parts of Mexico upwards of one hundred ploughs at work together. With these ploughs it is not necessary to divide the field into ridges, and they have only to begin at one side of the field and follow one another up and down, as many as can be employed together without interfering in turning round at the end, which they do in succession, like ships tacking in a line of battle, and so proceed down the same side as they came up.—*Forbes's California.*

Steam.—If the wild tribes of Lake Huron were even at this moment to be told that the white man's recipe for conquering the waves of the great lake before them was to take up a very small portion of it and boil it—if, sixty years ago, Dr. Johnson had been (as, exhausted by a hard day's literary labour, he sat ruminating at his fire-side, waiting for his favourite beverage) told that the tiny volume of white smoke he was listlessly gazing at, as it issued from the spout of his block-iron tea-kettle, was a power competent to rebuke the waves and set even the hurricane at defiance—the red children of nature would listen to the intelligence with no greater astonishment than our venerable lexicographer would have received it. . . . . On salt water as well as on fresh—reeking and fuming under the line, as well as freezing in Canada—on crowded rivers, as well as on those whose shores are desolate—on large streams as well as on small ones—in bays, harbours, friths, æstuaries, and channels—on the small lakes of Ireland, Scotland, and Switzerland—on the large ones in America—on the Red Sea—on the Black Sea—on the Mediterranean—on the Baltic—in fair weather, in foul weather—in a calm as well as in a hurricane—with the current, or against it—this power, when tested, has most successfully answered the great purpose for which it was beneficently created; and it is impossible to reflect on the thousands of human beings who at this moment are being transported by it—it is impossible to summon before the imagination the various steamers, large and small, which, in all directions, in spite of wind and weather, are going straight as arrows to their targets, without feeling most deeply that after all there is nothing new in the discovery that "the spirit of God moves upon the face of the waters."—*Quarterly Review.*

Clearing Land in Canada.—The process is begun by cutting with a heavy bush-hook the shrubs and slender saplings, which are then piled in large heaps; the axe follows and cuts down the young trees, the larger ones being left for the present: the felled ones are cut in lengths and piled with the limbs on the brush-heaps. All these have been cut quite close to the ground, so that the stumps may offer no obstruction to the harrow: all being piled, nothing remains but to fell the large trees, which is done at about two feet from the ground, the stumps being permitted to remain till the gradual decomposition of the roots allows of their extraction—a work of years. The trunks of the trees are now chopped into lengths; those which are useful for fencing placed by themselves, to be removed; and the remainder, by the efforts of oxen with chains and men with levers, are piled one upon another, and the tops thrown into heaps as before. In this state everything remains during the summer exposed to the burning sun of July, August, and September, which dries up a good deal of the moisture, and makes the heaps fit to burn. In the fall (autumn), advantage is taken of a dry time to put fire to the logs and brush, which burn rapidly, and are usually consumed, with the exception of some remnants of the log-heaps, which are piled together for a final burning. The running of the fires over the ground kills every vegetable, and the fertilising ashes make the whole in good order for culture. The plough is not put into the ground for some years, until the small stumps and roots have decayed; it is merely harrowed over, the virgin earth being soft and mellow; and grain is sowed with grass-seed. After the first crop, it remains in grass for several years. Such is the ordinary practice, slightly varying according to circumstances.—*Gosse's Canadian Naturalist.*

HORSE ARMOURY IN THE TOWER.—V. Henry VII.

[Henry VII.]

Passing over the short nominal reign of Edward V., we must pause to describe some remarkable additions made in the succeeding reign, that of Richard III., which, although not of long duration, was remarkable for the great change made in the fashion of the armour. This change consisted not only in the greater richness of the suits, but in the shape of the different portions, which were greatly altered, and in the addition of various pieces hitherto unknown.

The most striking peculiarities consist of the enlarged dimensions of the knee and elbow pieces, which, being generally of a fan-like shape, project from the body with a very grotesque effect; and the pauldrons rise on the shoulders so as almost to present the appearance of the later pass-guards. These characteristics are not, however, exhibited in the Tower armoury, as that collection does not possess a suit of the period we are now speaking of; but they may be seen in the effigy of Sir Thomas Peyton in Isleham Church, Cambridgeshire, which affords one of the best authorities for armour of the reign of Richard III. The salade, and the haussc-col, or gorget of steel, were still worn, the former being surmounted by the knight's cap and crest, or, as in the preceding reigns, surrounded by a roll of silk or linen of the wearer's colours, with a feather at the side.

The sword is belted so as to hang almost in front of the wearer, while the dagger is attached to the right hip. Every variety of fantastic shape was adopted for the shields in tournaments, but in battle they were almost constantly of a pentangular form.

The portions of iron covering which the archers and military men of inferior rank had been accustomed to wear, but which had been gradually becoming less common, were at this period almost entirely laid aside; leather jacks, jazerine jackets, and short linen or cloth doublets, the latter most frequently white with St. George's cross upon them, being generally worn by archers, billmen, and guisarmiers. They however retained the salade, or wore in its stead a round iron pot-helmet, or skull-cap.

The outré and somewhat ludicrous appearance presented by the richer suits of armour of this reign was greatly modified in the reign of Henry VII., when it assumed a more simple and more elegant form, retaining however the richness imparted to it by engraving and other ornamental effects, which indeed were even carried to a greater length. Armour *ribbed* and *fluted* in many places was very commonly worn, being besides ornamented by the engravers, the most eminent and skilful of whom were sought for by the princes and noblemen of the age. The armour was principally imported at this time from Germany, and many specimens of the work of the best German artists yet remain to attest the care taken by the wearers to ensure the utmost perfection in the decoration of their iron panoply. Gold and silver were also profusely employed, being inlaid in the steel in pictorial or arabesque designs; and in some cases, where engraving was employed, the interstices, or marks of the graver, were filled up with a black composition called *niello* by the Italians, and much used by the goldsmiths of those times to give effect to such of their productions as had been ornamented by the chaser.

The breastplate in the time of Henry VII. had acquired

a globular form, bulging out from the breast with no very beautiful effect, and was composed of but one piece, as in the time of Edward IV. The helmet fitted close to the head, and was provided with moveable lames or plates at the back, to guard the neck and yet to allow the head to be thrown back with ease, in a manner similar to the casquetels of the reigns of Henry VI. and Edward IV. It opened to receive the head by throwing up the mentonnière, or lower part that guarded the chin and throat, as well as the visor, which turned upon the same screw. Towards the latter end of this reign the *panache*, which had first appeared on the apex of the bascinets of Henry V.'s time, was changed for the *plume*, inserted in a pipe affixed for the purpose to the back of the helmet, just above the neck-plates, and instead of consisting of, at the most, but *three*, was now composed of a profusion of magnificent feathers that streamed down the shoulders almost to the crupper of the horse. The helmet used at tournaments was generally oval-shaped with a salient angle in front, and was surmounted with the orle, or chaplet and crest. An additional protection for the neck was introduced about this time called pass-guards, being plates rising perpendicularly from the shoulders so as to ward off the thrust or blow of a weapon directed to the side of the neck. These are very conspicuous in the armour in the Tower placed on the figure intended to represent Henry VII., and may be seen in the engraving from that figure at the head of the present article.

But the new feature in the armour of this period is the *lamboys* (from the French *lambeaux*), a sort of petticoat of steel, intended to supersede the use of the tassets and tuiles hitherto worn, and made in imitation of the cloth or velvet petticoats much worn by civilians of the time. These at first were but of small dimensions, but as they became popular, they increased in length and width until (as we shall see when we come to the reign of Henry VIII.) they descended to the knees, and were formed into folds similarly to a very wide piece of drapery tied round the waist. The sollerets were formed in imitation of the shoes of the period, which, with the proverbial fickleness of fashion, had become so extremely wide at the toes, that it was considered proper to restrict their dimensions by an act of parliament.

The tabard, or coat of arms, which had once been so important an article in military costume, was now but seldom worn, or only on state occasions; indeed the portions of armour which it would have covered were just those parts which were the most highly ornamented, and consequently the parts which the warriors were the most desirous to present to the public view; and even if the armour was not fluted or engraved or otherwise ornamented, it was considered more noble and warlike to expose the highly polished steel than to hide it by a garment having so little the appearance of anything connected with "high deeds of arms and well-contested fields." Henry VII. is, however, represented on his great seal as habited in it.

The shields were so various in shape and dimensions, that it would be perfectly useless to attempt to designate any particular form as the prevailing character of this article of defence at the time of which we are now speaking. The swords, which were made very long, taper to a point, and have a ridge down the centre on both sides the blade. Of the inferior weapons, the halberd, introduced in the reign of Edward IV., was becoming very popular in the English army, in which companies of halberdiers were formed, and held a distinguished rank among the infantry. But the hand-gun was quickly superseding all other weapons in the hands of the common soldiery, and in this reign it received an impetus from the introduction of the arquebus (corrupted from arc-a-bouche or arc-a-bousa), which differed from the original hand-gun in having a sort of lock attached to the iron tube, with a cock to hold the match; this being in the form of the letter S reversed, was called the serpentine; it turned on a pivot in the centre, and the upper end, which held the match, was brought down to the pan by pulling back the lower end. When Henry VII. established the body of yeomen of the guard in 1485, he armed half of them with bows and arrows, and the other half with arquebusses.

DRUMMOND AND BUDE LIGHTS.—II.

In our last paper on this subject we collected the most important facts concerning the origin and use of the Drummond light. The experiments there detailed were made nearly ten years ago. The intensity of the light is beyond dispute; but we are not aware what other difficulties may have prevented its adoption in our lighthouses. On this subject Lieut. Drummond, in his communication to the Royal Society in 1830, says:—"It now only remains for me to perform the agreeable task of bearing testimony to the liberal spirit evinced by the Trinity Corporation on this occasion, and to the desire which they have manifested of facilitating, by every means in their power, the introduction of this method of illumination into lighthouses. Indeed I hesitate not to express my belief that, if this do not take place, it will arise from some insurmountable difficulties in the way of its practical application, and not from the want of a full and impartial trial on the part of that body, to whom these establishments are entrusted." As the subject of this paper merely relates to the production of the light itself, we shall not offer any remarks on lighthouse arrangements in other respects; but we shall merely observe that the non-employment of the lime light is probably due to the dangerous nature of the mixed gases employed. When mixed, there is danger of an explosion of a very awful kind, which nothing but the most perfect apparatus, and the most careful attention from the persons employed, can avert. Lieut. Drummond devised a very ingenious mode of supplying the lime balls as fast as they were needed; but the supply of the gases is a source of some apprehension.

It may be proper here to describe the nature of a powerful light which has been employed in most of the French lighthouses for some years past, and which differs totally from our English arrangements. A very powerful lamp on the Argand principle is placed in the centre of the upper part of the lighthouse: this lamp was, we believe, suggested by M. Fresnel, and has four concentric wicks, the outer one more than three inches in diameter, with air passing up between the wicks to feed the flame. Around this strong light eight lenses, thirty inches in diameter, are arranged, touching each other at the edges (being square), and forming a hollow octagonal space about the lamp. Above these, smaller lenses of a similar construction are arranged; but so shaped, that by inclining inwards, they all meet towards the centre of the building, leaving only an opening for smoke, &c. to escape. The light yielded by the lamp, therefore, strikes upon glass lenses in sixteen different directions: through eight of these lenses the light is refracted and focalised at a long distance off; while that portion of the light which falls on the oblique over-hanging lenses is afterwards reflected downwards so as to become nearly parallel with the other rays. By the revolving of this apparatus, every lens in turn throws the rays out to sea, while only one single lamp is employed for the whole. Each lens is too large to be made from one piece of glass; it is therefore built up of several concentric zones or rings, and called a polyzonal lens, a form suggested by Sir D. Brewster thirty years ago.

About two years ago, the French journals spoke with great commendation of an intense light which had been recently proposed by M. Gaudin. This light was capable

of being produced with any desired degree of intensity; and its employment was suggested in lighthouses as well as other public places. We are not aware whether any useful application of this light has yet been made; but it appears to have been in its nature a modification more or less remote of the lime light employed in Ireland.

We have now to speak of another mode of illumination, which, from circumstances that have recently occurred, seems as if it would be brought into profitable employment; we mean that light which is called the "Bude," the "Oxy-oil," and the "Gurney Light;" the first name derived, we believe, from the residence of the inventor in Cornwall, the second from the mode of action, and the third from the name of another inventor. The nature of this light is as follows:—In an Argand lamp, as we have before stated, the wick is cylindrical, in order that a current of air should pass up through the centre, and feed the inflammable vapour and volatilised carbon which exists in the middle of the flame; and it is this part of the arrangement that constitutes the peculiar merit of the Argand lamp over the other forms which preceded it. Now the principle of the Bude light consists mainly in passing up a current of *oxygen gas*, instead of one of common air, through the wick of an Argand lamp. The lamp employed is an Argand, with a wick of any required diameter, say one inch. Inside this is carried up a tube, nearly to the top of the wick. This tube is in connexion at the lower end with a gasometer containing oxygen gas, which is easily obtained from an oxide of manganese, plentifully found in many parts of England. When the lamp is trimmed with its wick and a sufficient supply of oil, it is kindled, and the oxygen gas made to pass up through the middle of the flame. In so doing it promotes the rapidity of the combustion, and the result is a large increase in the intensity of the flame. We have witnessed the brilliancy of the flame thus produced at the Polytechnic Institution a few months ago.

Such then is the nature of the Bude or Oxy-oil light, and two circumstances contributed to bring it into notice, viz. 1st, an inquiry into the lighthouse system; and 2nd, the erection of the temporary House of Commons. We have said that the Drummond light produced very favourable results when used at the temporary lighthouse at Purfleet; but as the choice of lights for those buildings rests rather with the Trinity House than with the government, no steps seem to have been taken by the latter, while there were probably some other circumstances which prevented the adoption of the plan by the Trinity House. In 1834, however, a committee of the House of Commons was appointed to inquire into the whole subject of lighthouses, both with respect to the light employed, and to the whole system of management. A great deal of valuable evidence was received on various parts of the subject; and the Committee recommended to the Trinity House that another series of experiments should be made on the "Lime" light. These experiments were placed under the guidance of Mr. Gurney, who had, eleven years before, suggested the possibility of applying the lime light to lighthouse purposes. In the course of the experiments thus prosecuted, it was found that there were certain serious obstacles to the use of the lime light; and these obstacles led to the suggestion of sending up a stream of oxygen gas through the wick of an Argand lamp. A series of experiments were afterwards made, by scientific men engaged for that purpose, on the comparative merits of the Argand lamp, the French or Concentric-wick lamp, and the Bude lamp, without reference to the Drummond light. The results were given in a Report sent to the Trinity House; and the most prominent points in those results were the following:—that a French lamp, by consuming eighteen times as much oil, produced about ten times as much light as a common Argand lamp; and that a Bude lamp will yield nearly twice as much light as a French lamp.

This Report on the availability of the Bude lamp for lighthouses was made in 1838; but there has not yet, as far as we are aware, been any actual application either of the Drummond or Bude lights to lighthouses now in action.

We proceed to the other circumstances connected with the public use of the Bude light. After the burning of the Houses of Parliament a few years ago, there was a temporary building erected for the sittings of the House of Commons, until the permanent building, from the plan of Mr. Barry, is completed. In this temporary building there have been some new methods adopted for warming and ventilating the house, for admitting pure warm air, and expelling impure air. The nature and the success of these contrivances it does not form part of our present subject to consider. It was, however, found that the unconsumed carbon, the carbonic acid, &c., arising from the wax candles burnt during the evening and midnight sittings of the House, greatly interfered with the plan of ventilation adopted by Dr. Reid; and it was determined that an attempt should be made to employ gas instead of wax candles, and that a screen of some kind should entirely separate the flames of gas from the body of the house.

Accordingly towards the conclusion of 1837, the necessary arrangements were made for bringing the gas to the house and arranging the jets in proper order; and on a certain evening in the early part of the following year, after a preliminary trial had been made, the gas-lights were ignited during the evening sitting of the House. The arrangements were as follows:—There were two ceilings to the house, namely, the flat lath and plaster ceiling connected with the roof, and a second ceiling placed a few feet below it. This lower ceiling had been introduced to facilitate the arrangements for hearing and ventilating, and it was now made available for lighting. It was not flat, but was divided into three portions running lengthwise, the central portion being highest and quite horizontal, and the side portions inclining downwards, till they met the walls. The sloping portions were glazed with ground-glass throughout their length, and above the glass were placed three rows of gas-pipes, each pipe perforated with holes about two or three inches apart for the purpose of throwing out several hundred jets of gas. These jets were then lighted, by means of tapers, from end to end of the pipes, and a brilliant illumination spread through the whole house; the light, although intensely strong in itself, being subdued by descending through the ground glass.

This was the nature of the experiment made, and the light produced appeared to be satisfactory; but the expense was very great, it being estimated that the gas would cost 30*l.* per night; whereas the wax candles (about 240 in number) cost 5*l.* per night. From this circumstance chiefly the plan of lighting the house by gas was abandoned.

Nothing farther was decided on until last year, when, in consequence of the experiments which had been made at the Trinity House on the Bude light, it was suggested that this light might possibly be available for the House of Commons. The first point to be determined was the comparative cost of lights of equal intensity, when produced from the Bude lamp, and from wax candles. From some experiments made on this point, it was found that an amount of light which could be produced by the Bude lamp at an expense of 10½*d.* would cost 26 pence when produced from wax candles. The economy of the new method seemed therefore sufficiently obvious. Among the objects which it appeared desirable to attain were these:—that the light should be free from danger; that it should be applicable in the hands of ordinary men; that there should be a sufficient illuminating power; that the expense should not exceed that of wax lights; that the heat resulting therefrom should be entirely insulated from the

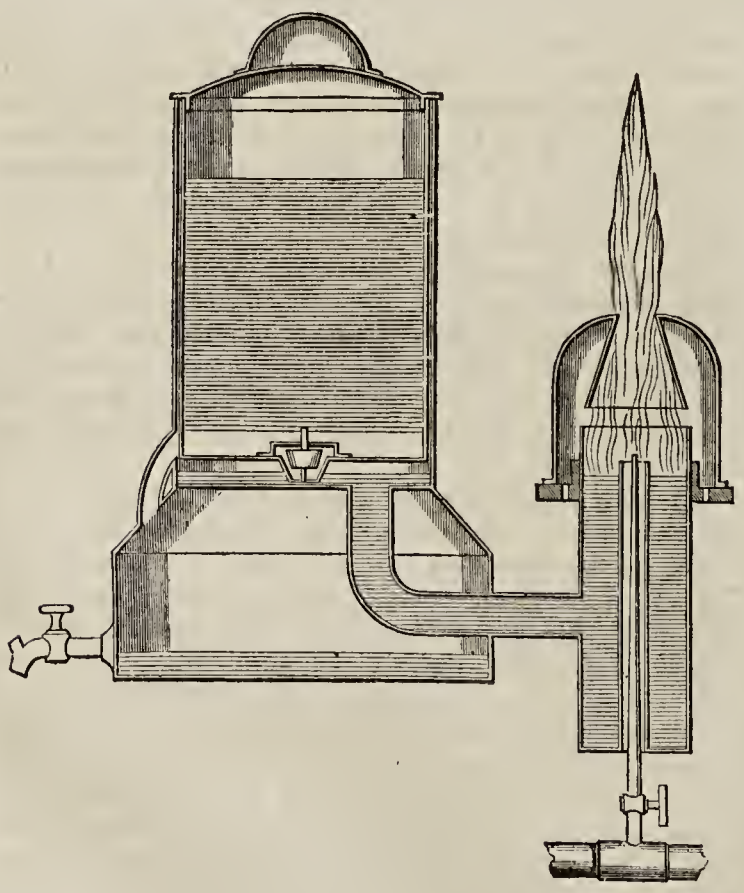
house, so as not to affect the ventilation, &c.; and that the light, instead of being glaring, should meet the eye in a softened and subdued form. On all these points various experiments were made.

It was resolved that during the recess experiments should be made on the best mode of arranging the lights preparatory to the present session. Some of the difficulties have been surmounted, and the house is now under a second course of experiments to ascertain the cheapness of the Bude light. These, it will be remembered, are Argand lamps, supplied with oil in the usual manner, and also with a stream of oxygen gas passing up through the centre of the wick. There are several lamps placed on each side above the sloping glazed skylights.

A few months ago the Bude light was employed to illuminate the face of the clock at the Horse-Guards: the hands and figures are rendered very distinct, and appear as if lighted by strong lunar rays.

There have been several improved forms of lamps lately proposed; but we have only space to allude to one more: this is Beale's light for manufactories. It was proposed as a means of using a very cheap substitute for oil, namely, the refuse tar of a gas-house. This can be purchased at an extremely low rate, and under ordinary circumstances yields only a slight lambent flame, scarcely perceptible. The means of making it available however are these:—The lamp employed is somewhat similar to an Argand, with a hollow circular wick. Up this hollow wick ascends—not air in the same state as for the Argand—not expensive oxygen gas, as in the Bude light—but a current of common air *under pressure*. The lamp is intended for manufactories where steam or other power is employed, by which air can easily be condensed in a small reservoir, and thence conducted through a tube to the lamp. With a pressure of one pound and a half on the square inch, the air rushes up the centre to the wick in such quantity and force as to convert the faint flame into one so intense as to equal, according to Professor Barlow, four and a half Argand lamps.

Fig. 4.



[Beale's Lamp.]

Still more recently a modification of this lamp, called the Air and Vapour Lamp, has been proposed, in which the air is made to mingle with the vapour of the liquid tar before the latter is ignited.

Omnipotence of the Creator.—The same Being that fashioned the insect, whose existence is only discerned by a microscope, and gave that invisible speck a system of ducts and other organs to perform its vital functions, created the enormous mass of the planet thirteen hundred times larger than our earth, and launched it in its course round the sun,—and the comet, wheeling with a velocity that would carry it round our globe in less than two minutes of time, and yet revolving through so prodigious a space that it takes near six centuries to encircle the sun!—*Lord Brougham's Notes to Paley's Natural Theology.*

Aid of Nature in Manufactures.—Does nature nothing for man in manufactures? Are the powers of wind and water, which move our machinery and assist navigation, nothing? The pressure of the atmosphere and the elasticity of steam, which enable us to work the most stupendous machines—are they not the gifts of nature? to say nothing of the effects of the matter of heat in softening and melting metals, of the decomposition of the atmosphere in the process of dyeing and fermentation. There is not a manufacture which can be mentioned, in which nature does not give her assistance to man, and give it, too, generously and gratuitously.—*David Ricardo.*

Kidney-Beans and Scarlet-Runners.—The seeds of the white kidney-bean and scarlet-runner are much used abroad, and a trial of them is much recommended to the British cottager. They should be soaked in water for several hours; some persons put them in over night. Put them into cold water for boiling with some salt in it. They require much boiling when old, but are then best. Check the boiling with a cupful of cold water when they begin to swell; they will then burst like a mealy potato—drain them immediately, and put them by till required to prepare for dinner. The best mode of dressing them is this:—Put a lump of clarified fat or butter into the saucepan; when melted, dredge in about a third part of a table-spoonful of flour; when mixed, add a wine-glassful of water or broth, stir it till it boils, then add the beans (prepared as above), with some chopped parsley, some pepper and salt, and with or without a chopped shalot: cover the vessel, and shake it now and then over the fire, till the beans are quite hot enough, and have had a couple of boils. They may be tossed up with any remains of cold gravy.—*Labourer's Friend Magazine.*

Motives for making Roads in Africa.—The king of Wowow is making new roads and repairing and widening the old ones leading to and from the city. This is the only instance we have yet seen wherein even the slightest attention has been paid by a chief to the state of the public pathway during the whole of the journey from Badàgry to Yàoorie; and the reason urged by the ruler of this place for undertaking the business is somewhat singular, though shrewd and just. 'If,' says he, 'an enemy were to come towards my gates with a hostile intention, and find the roads broken up or overgrown with weeds, would they not say among themselves, "Oh, this king of Wowow is a careless, slothful, cowardly governor; his town contains but few inhabitants, for see, the path is green and untrodden by human feet; let us go and attack it, for it will easily fall into our hands?" But,' he continued, 'should they find it of convenient width, smooth, and free from grass, they would immediately say,—"This road is trodden by the feet of many people; the town must be populous, strong, and flourishing, and its monarch watchful and brave; if we venture to make an assault, we foresee that we shall be overpowered and slain; it is better for us all to turn back while we are yet undiscovered and unharmed, lest some evil fall upon us when it is too late to retreat."' Thus the talkative old king argues with his people, that they may throw off that laziness which is natural to them, and be animated to industry and labour in the common cause.—*Lander's Journal.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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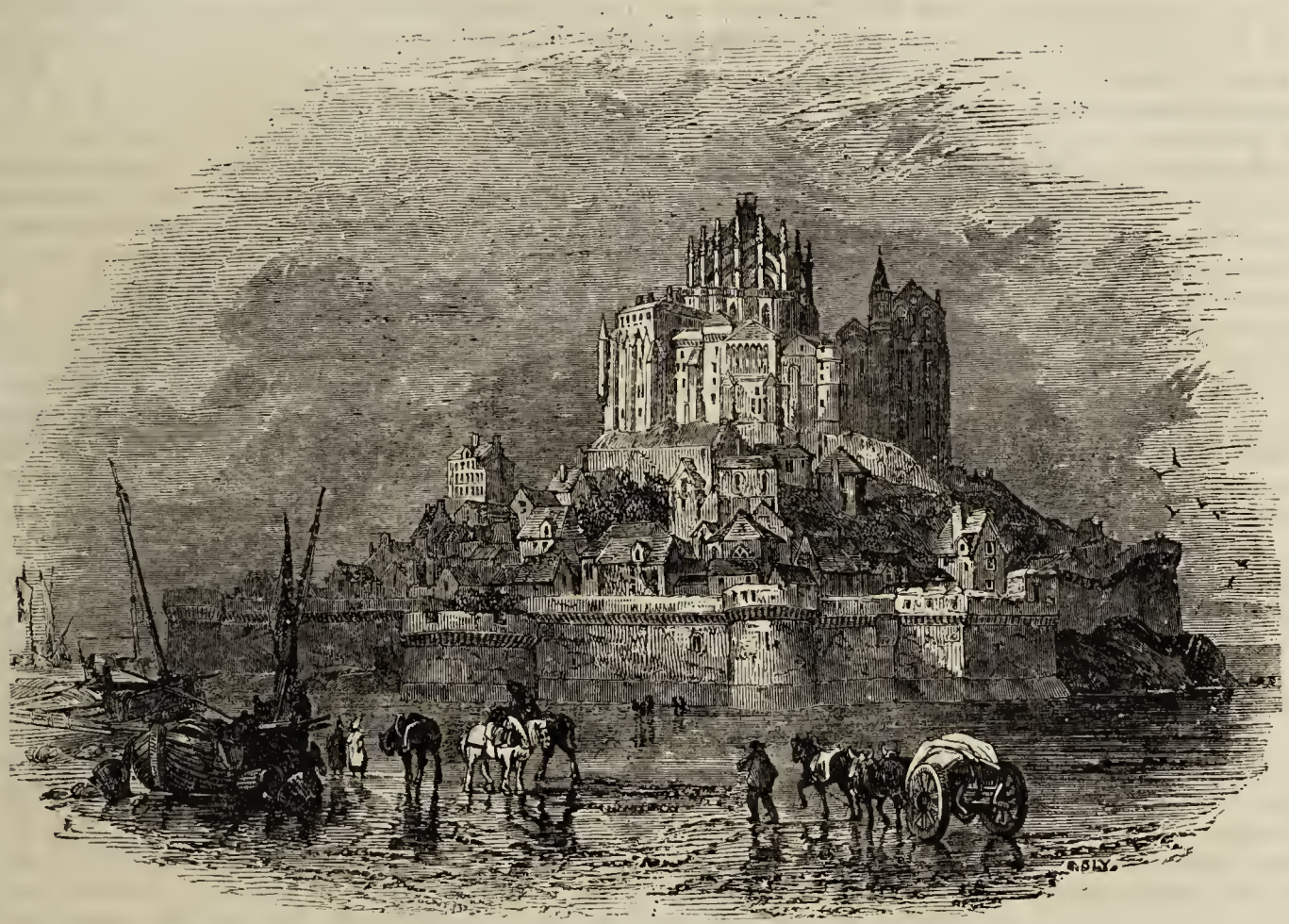
MONT ST. MICHEL.



[Mont St. Michel, Department of La Manche, France.]

BETWEEN Cape La Hogue and a projecting part of the French coast north-west of Brest there is an extensive indentation of the sea, called the Bay of St. Malo, which forms the boundary of three departments, La Manche, L'Ile et Vilaine, and Les Côtes du Nord. Mont St. Michel is situated in the angle formed by the sides of this bay. It is a majestic rock, rising in the midst of a vast plain of sand, which, at high-water, is overflowed by the sea. In some places it is nearly perpendicular, and in others, where nature has left it more accessible, it is flanked by towers and bastions. As it was impossible at the same time to convey an idea of the singular situation of Mont St. Michel and the character of the buildings with which it is covered, the latter object only has engaged the artist's attention in the wood-cut. Let the reader, however, "imagine a desert of sand, consisting of eight square leagues of surface, traversed by several rivers, the waters of which in some places spread themselves out in the form of a lake. Carry your eye beyond this desert of sand to a still mightier desert of sea, which you will know by its deeper colour; and just before arriving at the margin (not easily ascertained) of the latter, build up a granite rock with towers, on a base of a quarter of a league in circumference, to the height of five hundred feet. This is Mont St. Michel at the reflux of the tide. Then fancy that the desert of sand was but a dream, and that the great ocean fills the whole area, and rear in the midst of this waste of waters the same granite mountain. This is Mont St. Michel four days before and after the new moon."* Such a rock, surmounted by a church and buildings which give it the air of a fort and a prison at the same time, would be a remarkable object in any situation; but placed as it is, neither belonging wholly to the land nor yet to the water, the impressions which it creates on the spectator are of a singular and impressive character.

The view from the highest parts of Mont St. Michel embrace the coasts of Brittany on the left, and Normandy on the right. Eastward the eye is caught by the view of towns and villages, and westward the horizon is bounded by the ocean. Although the rock may be approached when the tide has ebbed, the passage across the sands should never be ventured upon by persons unacquainted with the track, as there are quicksands in which strangers have been frequently lost; and a guide is therefore absolutely necessary. There is also considerable danger in case of a thick fog suddenly obscuring the atmosphere; and it is the practice at such times to ring the bells of the village churches on the mainland to direct those who might otherwise be wandering on the sands until the tide rushed in and engulfed them.

There is a small town on Mont St. Michel, inhabited chiefly by a few innkeepers, shopkeepers, and fishermen A steep and crooked street leads to the abbey and the castle, the latter being appropriated as a prison for political offenders. This fort is of course strictly guarded, and strangers are not admitted. The buildings rise to a great elevation, and subterranean excavations are made in the rock; but the more humane spirit of the age has caused the dungeons of the middle ages to be abandoned, so far as the incarceration of human beings is concerned.

* 'Landscape Annual.'

The provisions and other articles for the supply of the prisoners are hoisted up by pulleys from the outside of the rock. There is a telegraph on the top of the church, which communicates with Paris.

The chapel, dedicated to St. Michael, was first erected about the year 708; about 966, Richard, the first duke of Normandy, formed a convent of monks of the Order of St. Benoit; and about 1024, Richard, the second duke of Normandy, built the church, which still exists. The shrine of St. Michael drew many pilgrims from all quarters, amongst whom were the kings of France and the dukes of Brittany, who did penance here. The passage of the sands by several hundred of these pilgrims must have been a pleasant sight in those times. Religion and war, the prominent features of these times, alike contribute to the celebrity of Mont St. Michel. In 1423, it was besieged by the English, who had been pursuing their conquests in France almost without interruption from the battle of Agincourt in 1415; but they were not successful in their attack upon the rock, and two large clumsy pieces of ordnance, which they left behind, are still shown amongst those curiosities of the place which visitors are permitted to see.

USEFUL PRODUCTS OF THE WHALE.—No. I.

In our second volume (No. 74) we presented the reader with a brief sketch of the objects, the excitements, and the dangers of the whale fishery. We propose now to follow up that account with a few details respecting the useful products of the whale, and the manner in which those products are rendered fit for the market.

There are many uses to which different parts of the whale are applied in England and other manufacturing countries, the principal of which are *oil*, extracted from the fat; *whalebone*, taken from the mouth; *spermaceti*, taken from the head; and *glue*, extracted from the muscular fibres of the tail. But among less civilised nations its uses are more varied. The inhabitants of the northern shores of both continents make an article of food of the flesh, eating the solid parts and drinking the oil. Even the skin is eaten raw. "It is not uncommon," says Mr. Scoresby, "when the females visit the whale-ships, for them to help themselves to pieces of skin, preferring those with which a little blubber (fat) is connected, and to give it as food to their infants suspended on their backs, who suck it with apparent delight. Blubber, when pickled and boiled, is said to be very palatable; the tail, when parboiled and then fried, is said to be not unsavoury, but even agreeable eating; and the flesh of young whales, I know from experiment, is by no means indifferent food." Even in the more southern parts of Europe, three or four centuries ago, the flesh of the whale was considered by no means unpleasant food. The Esquimaux supply many of their simple wants from various parts of the whale. From some of the membranes they make outer garments; from a stiff but transparent skin they prepare a substitute for glass in the windows of their huts; from the bones they make harpoons, spears, supports for tents, and ribs for boats; from the sinews, divided into filaments, they make thread; and from the substance erroneously called by us whalebone, they produce numerous articles.

We may here state that the species of whale captured for the sake of the oil and whalebone, viz. the Greenland whale, is not the same as that from which spermaceti is procured, and which is called the sperm whale. Let us suppose then that a Greenland whale has been captured, towed by the men in the boats, and secured to the side of the ship. The operations of the men are then to cut off and collect the blubber, the whalebone, and the jaw-bones, and to leave the rest of the carcass to its fate. Blubber constitutes the fat of the animal, and encompasses the whole body immediately beneath the external skin; it is of a firm consistence, and of a colour varying from yellowish-white to salmon colour. It lies in a compact bed from eight to twenty inches in thickness, all over the whale. The under-jaw, the lips, and the tongue are composed almost wholly of this substance. The constitution of the blubber appears to be an oily matter contained in an assemblage of minute cells formed of tendinous fibre; the oil is separable from the fibres by heat, and also by the effects of decomposition. Whalebone is situated within the animal's mouth in the position where teeth might be expected to be found. This species of whale has no teeth, and the use which it derives from the whalebone will be better understood by a consideration of the mode in which the animal collects the small fish which form its food. When the whale feeds, it swims with considerable velocity below the surface of the sea, with its jaws widely extended. A stream of water consequently enters the capacious mouth (which is often large enough to contain a merchant-ship's jolly boat full of men), along with vast quantities of small fish, insects, &c. The water escapes at the sides, but the food is entangled and stopped by a kind of grating formed of strips of whalebone, which stretches across within the cavity of the mouth; by this means a "mouthful" is gradually collected, and then swallowed. This grating is composed of two rows or "fins" of whalebone, suspended from the upper jaw, one on each side of the head, and almost meeting in front. Each "fin" consists of more than three hundred laminæ or plates of whalebone, the longest near the middle, from which they gradually diminish away to nothing at each extremity. The longest lamina is from ten to fifteen feet in length, according to the size of the animal, and diminishes in breadth from ten or twelve inches nearly to a point, the greatest thickness never exceeding half an inch. Each piece is therefore a blade, some of them of formidable dimensions. These blades are ranged side by side, two-thirds of an inch apart (thickness of the blade included), and resemble a frame of saws in a saw-mill. The interior edges are covered with a fringe of hair, and the exterior edge of every blade is curved and flattened down, so as not to cut the inside of the lip. The colour of the blades is a brownish or bluish black, sometimes striped longitudinally with white. The blades are inserted into the bone in a sort of groove; and all the blades forming one series or "fin" are connected together by a kind of gummy substance at their thick ends. This gum is white, fibrous, tender, and tasteless; it cuts like cheese, and has somewhat the appearance of the kernel of a cocoa-nut.

Such being the nature and position of the blubber and the whalebone, for which this whale is principally captured, the proceedings of the captors are as follows:—The whole of the operations are performed at the ship's side, the animal being far too ponderous to be hauled on deck. The dead whale being secured by ropes, some men descend upon its body (their shoes being armed with spikes to prevent them from slipping), and firmly attach some hooks to the fat or blubber surrounding the neck. A band of blubber, two or three feet in width, and passing round the animal immediately behind the head, is called by the whalers the kent, and to this kent the hooks are secured. The hooks are attached to pulleys connected with the rigging of the ship, and the object is to be able to turn the whale over and over by unwrapping the kent, as it were (like a bandage), from around the animal. The tail is cut off, and conveyed on board, and the men begin to cut off the blubber. They are provided with knives and spades of various kinds, large and small, with which they divide the blubber into oblong pieces, or "slips." Each piece, as it is cut off, is hauled up by a pulley into the ship, until the whole is removed from that side of the whale which happens to be uppermost, generally the belly. By a powerful movement of the tackle connected with the kent, the animal is turned or "kented" partially round, so as to present

another layer or strip of blubber, which is cut off as before, from head to tail. By successive turnings and cuttings the mighty monster is deprived of the whole of what once formed the fat of his body. The muscle, flesh, or meat of the whale is situated beneath the blubber, and is not taken, because it yields no oil; it is of a reddish colour, and when cleared of fat, broiled, and seasoned with pepper and salt, is said to eat not much unlike coarse beef, if the whale be young.

While the whale is on its side an opportunity is offered for removing the whalebone. The lips being cut away, the whalebone is seen lying nearly horizontal. The whole of the mass of blades composing one side or series are removed at once by means of "bone-handspikes," "bone-knives," and other instruments, and hoisted on deck by means of tackle. Next, the jaw-bones are cut away and hoisted; and lastly, the long slip of blubber called the "kent," and which has become unwound, as it were, from the neck of the animal, is separated from the carcass and hauled on board, its length sometimes amounting to thirty feet.

The whole of the operation is called "flensing" the whale; and when completed, the tackle is disengaged, and the carcass set at liberty, which sometimes sinks, but at other times remains floating, and becomes food for bears, sharks, and various kinds of birds, all of which attack it with great earnestness. "When sharks are present, they generally take the liberty of helping themselves very bountifully during the process of the flensing; but they often pay for their temerity with their lives. Fulmars pay close attention in immense numbers. They seize the fragments occasionally disengaged by the knife, while they are swimming in the water; but most of the other gulls who attend on the occasion take their share on the wing. The burgomaster is decidedly the master of the feast. Hence every other bird is obliged to relinquish the most delicious morsel when the burgomaster descends to claim it. Bears seldom approach so near the ship as to become partakers of the banquet."*

As the various parts of the booty are hauled on deck, they are immediately stowed away. When the ranges of whalebone are brought on deck, they are split, by means of "bone-wedges," into pieces called junks, each junk containing from five to ten blades; but occasionally it is subdivided into separate blades, and the gum and hair removed before the blades are stowed away.

It was once the custom to extract the oil from blubber on the shore of Greenland, immediately after the whale was caught, by the aid of furnaces and boilers erected for that purpose; but from various causes this plan is no longer pursued. It has also been tried to effect the same object on board the whale-ships; but this has likewise been found to be attended with more disadvantages than advantages. The blubber is therefore brought to England, and reduced to oil at Hull, Dundee, and the other whaling ports. The reason why it would be desirable, if practicable, to effect this operation soon after the whale is killed, is, that the oil produced is then purer. The blubber, being a soft animal substance, is very liable to decomposition during the time occupied by the homeward voyage; and it is believed that the rancid and unpleasant smell so frequently connected with whale oil is the result of this long keeping of the blubber; for the blubber, when fresh cut, is perfectly free from any offensive odour, and the oil produced from it on the spot is also exceedingly pure. But as the quantity thus produced is smaller, and as there are certain practical difficulties attending it, the blubber is now, we believe always, brought home to be boiled down into oil.

The pieces of blubber, as cut from the whale, average about half a ton each; and these are cut, on deck, and by means of large knives, into portable pieces containing about a cubic foot each. These pieces are passed down between decks, through a hole in the main hatches, and ranged in a compact manner, until all the blubber is collected from the animal. The receptacle is gradually filled with the produce of several whales, and when full, or when the crew have leisure to attend to the stowing away, the operation of "making off" is commenced,—that is, cleaning and packing up the blubber in barrels. The barrels are ranged all over the lower parts of the vessel, and the bung-holes are left open. A kind of trough is placed upon deck, and at the side of this is a table covered with pieces of whale-tail; this substance has great tenacity and elasticity, and serves well as a chopping-block, to prevent the table from blunting the edges of the knives. A hole in the bottom of the trough is connected with a shoot or spout leading down to the casks beneath the deck, through which the pieces of blubber may descend to their proper places.

All being thus ready, the operations commence. The pieces are thrown upon deck from the hold. From each piece is removed, by various instruments, all the muscular parts, together with such spongy or fibrous fat as is known to produce but little oil; all these impurities, called kreng, are thrown away. The next point is, to cut off the outer skin from each piece, by means of a large knife. The pieces or blocks of blubber are now tolerably clean, and they are laid on the tail chopping-block, and cut up into oblong pieces of sufficiently small diameter to pass through the bung-hole of a cask. These pieces are then allowed to fall down the tube in connection with the trough, and are then guided by a man into all the casks in succession. When each cask is completely filled, it is bunged up, and stowed away in the hold. When a ground-tier of casks is completed, another tier is heaped upon them, until there is a compact mass of casks filled with blubber. Should the number of casks be insufficient, the remaining pieces of blubber are laid on the top of the upper tier, with some salt sprinkled among them, to assist in preserving them. When all is thus packed, the vessel proceeds on its homeward voyage.

The quantity of useful substance produced from a whale is very large. The Greenland whale, if of full size, averages about 60 feet in length; and its greatest circumference, a little behind the fins, is about 35 feet. The jaw-bones are often 20 feet long and 10 wide; and the lips are from 15 to 20 feet in length. The tail is 20 feet wide and 5 or 6 long. The weight of whalebone found in the mouth frequently amounts to a ton. The entire weight of a large whale reaches the enormous amount of 70 tons, of which the blubber amounts to 30. Four tons of blubber yield, on an average, about three tons of oil. Each of the enormous lips yields from one to two tons of pure oil (the ton of oil here spoken of weighs about 1933 lbs.). The process of "flensing," or cutting the blubber and whalebone from a large whale, occupies a ship's crew about four hours; and the "making-off," or cutting up and packing, from eight to twelve hours, for the produce of each whale.

The process of stripping the whale while alongside of the ship is often exceedingly troublesome, and even dangerous. If the sea happen to be rough, the ropes and blocks are incapable of bearing the strain occasioned by the weight of a whale, and often snap, and wound the men who happen to be near. The surge, beating over the dead body of the fish, drenches the men with water, and as they have but a tottering standing-place (the slippery body of the fish), they are apt to wound each other with their knives. Sometimes, too, the men fall into the fish's mouth, when it is exposed by the removal of a surface of blubber; where they might easily be drowned, but for the prompt assistance which is always at hand. Captain Scoresby mentions an instance which came under his notice, of the dangers frequently attending this occupation. A whale having been stripped, or

* Scoresby's 'Arctic Regions.'

"flensed," and being about to be cast off, a man who was standing on the jaw-bone got his foot entangled. Before this was discovered, the ropes retaining the whale were cut, and it sank, carrying the poor fellow down with it. He caught hold of the edge of the boat, and actually remained for some seconds with the whole carcass of the whale suspended from his foot. His companions speedily came to his assistance, and succeeded in extricating his foot from the whale, just when he seemed in imminent danger of being drawn asunder by the enormous weight.

We have now packed our whale-ship, and sent her on her homeward voyage, where we shall leave her. In another paper we shall trace the subsequent operations on shore.

THE NEWCASTLE IMPROVEMENTS.—No. III.

[Continued from No. 515.]

[Interior of Green-Market.]

At length Anderson Place, the extent of twelve acres in the middle of the town, which we have before mentioned, came into the hands of a proprietor who was willing to sell it. It soon became known that Mr. Grainger had purchased it for 50,000*l*., and great was the curiosity among those who observed his proceedings, to learn what he would do with his new property. The secret was profoundly kept for a considerable time. His plans were matured in his own office, and not a single particular of them known till his arrangements were completed, as far as they depended on himself. Without act of parliament, he had bought other old property to the amount of 45,000*l*., enough to enable him to open communications between some of the busy parts of the town, distant from each other, which before could be reached only by widely circuitous ways.

The first object was to form a central street in continuation of Dean Street, a thoroughfare through the midst of the best part of the town. There were two principal obstacles to the execution of this plan, the Butcher-market, erected 24 years before, and the Theatre. These buildings stood directly in the way, and they were public property; so that further secrecy became impossible. His plans were submitted to public inspection. Before this, he had opened his designs, as usual, to Mr. Fenwick. Mr. Fenwick was naturally doubtful about the issue of so prodigious a speculation, and advised his friend to transfer his business (necessary as the good-will of the Corporation had now become), to the office of Mr. Clayton, the town-clerk, and a member of a very opulent and influential family. Mr. Clayton heartily embraced Mr. Grainger's schemes; and there is no doubt that the architect and the town owe much to the influence and the command of money secured by this professional connection.

The inhabitants were eager to examine Grainger's plans; and the popular voice was so strong in favour of their execution, that the Corporation yielded up the old market without difficulty, on the architect's proposal to erect another on a new site, larger, more lofty and airy, and with better approaches. The Corporation took 15,000*l*. for the old market, and gave 36,290*l*. for the new.

Mr. Grainger got possession of the Nuns' property, and began his operations upon it in August, 1834; and the New Market opened October 24, 1835. At the same time, the houses immediately surrounding it were finished, and the approaches opened. The occasion was celebrated by a public dinner in the market, at which about 2000 citizens were present, besides 300 ladies in a temporary gallery erected for their accommodation and that of the band. The last mayor of the old Corporation was in the chair. On this occasion it was stated, and has remained uncontradicted, that though the names of other architects are joined with that of Mr. Grainger, and though it is his practice so to consult them as to afford them the most liberal scope for the exercise of their powers of design, all the essential points of design, in erections for which he is responsible, are his own.

This market is the finest in the kingdom, exceeding even the Hungerford and Liverpool markets in size and convenience. The Newcastle exceeds Hungerford Market in the proportion of 9050 to 6400 square yards; and it exceeds St. John's Market at Liverpool in the propor-

tion of 9050 to 8235 square yards. This is exclusive of the ranges of neighbouring shops, which might not unfairly be considered as belonging to the market. No fault has been found with its arrangements, and it answers its purposes in every respect.

The Green-market is a hall 318 feet long, 57 feet wide, and 40 feet high. In this hall was held the Promenade of the British Association, in August, 1838, when the place was adorned with evergreens and a display of plants, and lighted with gas. The two elegant fountains were then wreathed with gas-lights, within the falling water, with beautiful effect.

The entire Market covers a space of 338 feet by 247. Its area is two acres. It has fourteen entrances from the streets, and contains 243 shops, to shut up and lock. The shops and avenues are ceiled and plastered. The basin of each of the two fountains holds 3000 gallons. The Corporation arms are seen in a recess at one end, and a clock at the other.

The Theatre was, as we have said, the other great impediment to the formation of Grey Street. It was of no older date than 1788, had cost 6000*l*., and was a neat and convenient building. There was some hesitation on the part of the proprietors about selling it, though no discontent at the terms offered by Mr. Grainger. At length, the bargain was concluded. In return for the old Theatre, Mr. Grainger gave the proprietors the new one (which we shall hereafter describe), and the sum of 500*l*. So far, however, were all parties from being agreed, that some of the persons concerned intended to apply for an injunction to stop proceedings. But to stop Mr. Grainger's proceedings requires more readiness than is often to be found anywhere but in himself. Within three hours from the sealing of the contract, the chimneys of the Theatre were down, and before any message could have reached London, the whole had disappeared. Another instance of his promptitude may be mentioned here. A house in Grey Street projected in an unsightly manner, so that it became of importance to the architect to get possession of it. The different owners of the house and cellar made difficulties, and Mr. Grainger was longer than usual in carrying his point. At last he succeeded, but not before the contest had interested the inhabitants, who amused themselves with watching whether the architect's design was to be injured by the projection of this one house. The purchase being effected, the tenant's family were, that very hour of the evening, removed to a house which Mr. Grainger had made comfortable for them; and their fires were still burning when the demolition of their late dwelling began. In the morning, when crowds came to see how the affair proceeded, not a vestige of the house remained.

The ground was now cleared for the "new town;" but yet greater difficulties remained in managing the levels. Mr. Grainger himself says, that his greatest fatigues and anxieties have been about his excavations. Over these he has spent many whole nights, after long days of labour. At his slackest times, his practice is to rise at half-past five; but he thinks little of occasionally devoting his nights to his works. The outlay of money, as well as of labour, in preparing the ground was prodigious. The purchase of old property was scarcely more expensive. As the new property lay in the Dean, hills had to be levelled and valleys filled up, to unite the new and old streets. The new lines of streets were indicated by poles stuck in the ground; and these poles so ran up hill and down dale, the summit of one being often below the root of another, that the spectators could hardly imagine this the site of streets that were to exhibit a perfect level or a gradual ascent. Throughout a wide area, the excavations for the streets were to the depth of 17 feet, and for the basement story of the houses, 27 feet. Close by, or in the midst, valleys had to be filled to the depth of 35 feet. Sometimes it was necessary to make a descent an ascent, and sometimes the reverse. All this was exclusive of the trenches for foundations, which were in some places 54 feet deep, having more masonry under ground than above. It may be worth while to relate the amount of work of this kind done in the Nuns' Field, in preparation for the new streets.

After filling up the valleys from the levelling of the ridges, soil was carted away, at 2*d*. per load, to the amount of 1040*l*. paid to one individual, and at least as much more elsewhere. Thus 250,000 loads were carted. At 18 cubic feet per load, this amounts to four millions and a half of cubic feet, or enough to cover, a foot thick, 103 acres of ground. The digging and carting, exclusive of the cost of deposit, amounted to 21,500*l*. This removal of soil is exclusive of the large quantity which Mr. Grainger used on the spot for his building purposes. Some parts of the ground afforded fine sand, of which his mortar was made; and in other parts the soil was a good brick-clay, in which case the spot was turned into a brick-field. During the erection of Eldon Square, several hundreds of thousands of bricks were made on the spot; and a similar economy of excavation has been practised wherever it was favoured by the nature of the soil. Mr. Grainger's friends have often been amused by tokens of his recollections of them in the midst of his business. Many a load of fire-wood has one or another of his acquaintance received from him while he was about clearing his ground.

The external difficulties having been disposed of, it remains to be inquired how the mind of the artist became fitted for the work he was now about to achieve. This no one seems able to explain,—not even the man himself. It may be understood how a man of clear understanding, an enterprising and placid temper, and strict integrity might become as perfect a man of business as Mr. Grainger is,—of remarkable foresight and comprehension of views, great prudence, and enabled by his honour and punctuality in pecuniary transactions to be enterprising to any extent. But whence he derived his powers as an artist remains a mystery. What his education was, we have seen, and how full has been the employment of his time since he left school. He has never been on the Continent, nor has associated with artists, except in consequence of his own enterprises. He attributes much to a visit to Edinburgh many years ago. What he saw there, gave him strong delight and a powerful impulse. He afterwards visited Dublin and London. It is also probable that he has of late derived advantage from such representations as books of plates can afford. This is all that is known of the training which enabled him to produce such works as we shall proceed to describe.

[To be continued.]

ACCOUNT OF AN EXTRAORDINARY MUMMY FOUND IN AUVERGNE.

The following account is extracted from the 'Travels in Auvergne, in 1787 and 1788,' by le Cit. Legrand, published in the 2nd year of the Republic, at the printing-office of the Arts and Sciences, Rue Thérèse, à Paris.

On the 4th of February, 1756, as two peasants of the village of Martres-d'Artier were digging in a field, one of them felt his spade strike against a stone about a foot beneath the surface. He removed the earth in order to take it up, but, instead of a common stone, discovered a lid of tiles with a stone tablet about eight inches square at the end. He concluded he had met with a treasure, and calling his companion, they worked great part of the night and the two following days in clearing away the soil, and found their prize to be a tomb shaped like a coffer, 7 feet long, 5 feet 2 inches high, and 32 inches wide, and so heavy that they could not move it. They broke one of its sides with their pickaxes, and found a leaden coffin within, which they conveyed clandestinely to their own

dwelling to search for any treasure it might contain; whether their cupidity was gratified or not, was never ascertained. They asserted that they found nothing in the coffin but the body, which they did not remove, but brought it back the next day, and replaced it in the tomb exactly as it was before.

There was nothing remarkable in the structure of the tomb; it was made of grey porous stone, very clumsily worked, without inscription, figure, or ornament. The coffin, like the tomb, was composed of two pieces, which shut close, one over the other; but there were two narrow apertures, about two inches long, in the coffin, one above the mouth, the other above the stomach of the corpse. The body was that of a boy of about ten or twelve years old, embalmed with skill, and so fresh and perfectly preserved that it was impossible to help admiring it.

Of all the mummies there is perhaps not one, except this of Martres, which has been preserved entire, and without any mutilation whatever, and with all the freshness and appearance of life which it retained in sleep.

No one has been able to discover of what materials the embalment was composed; all that I could learn from the official inquiry (procès-verbal) which took place at the time, and was inserted in 'Le Mercure,' April, 1756 (page 127), amounts only to this—that the composition was neither bitter nor acid; that it seemed to be a mixture of several aromatics so perfectly combined that no one could be particularly distinguished, but so active and penetrating, that by just touching it, the hand retained the smell for several days in spite of washing with hot water or vinegar, and that after a month, though exposed to the open air, the tomb had not lost its odour.

The process employed for the preservation of this mummy resembled in some respects that of the Egyptians. In the first place, a coat of this composition was spread over the whole surface of the body, and had given it a slight tinge of yellow. Then a very thin layer of tow; then a piece of fine linen, which enveloped the tow; then bandages which confined the linen. The feet and the hands were left bare, and enclosed in little bags filled with the aromatics; and the head was covered with a cap, which appeared to be a prepared skin. In this state the corpse resembled an infant in swaddling clothes. For the last envelope there were two handkerchiefs, the undermost of extremely fine linen; the outside one of coarser cloth resembling a mat. All the linen, the bandages, and the tow were impregnated with this aromatic mixture.

The body was placed in the coffin with the hands extended on the side. The head was large, and bald in front. The hair behind was chesnut colour, and about two inches long. On the top of the head an incision had been made, and the skin raised, as if to introduce the aromatics into the skull, but the skull not having been opened, it was not ascertained whether the compost had penetrated into it, or in what state the brain remained.

For the rest, the teeth, the ears, the tongue, and every part of the face remained uninjured, and had not suffered the slightest alteration. The lips were fresh and red, the hand white and plump, and, what was still more extraordinary, the eyes, which one should have thought would have been dim or obliterated, preserved the brilliance of those of a living person. All the joints were pliable, and could be moved; the fingers had even spring enough to return to their position when bent. None of the joints were stiff, except that of the foot; however, persons acquainted with anatomy observed with surprise that the bones of the legs and arms were soft, and could be easily bent, when all others, particularly the skull, had preserved their hardness. A surgeon who had made an incision with his knife into the region of the stomach, introduced his finger into the orifice to ascertain the state of the diaphragm, and also of the bowels. He found the one soft and supple, the others elastic and entire. If through the opening the breast-bone was raised, it moved and sunk again like a pair of bellows.

This astonishing elasticity proves how much the preparation of the mummy of Auvergne excels that of the Egyptian mummies; not even had the intestines been removed, as in Egypt, but remained entire and with all their springiness, insomuch that if they were blown into, they swelled out in a moment.

It is observed in the procès-verbal that they appeared to be spread over, both within and without, with some preparation which rendered them transparent; and this preparation was considered to be different from that on the body, as it appeared to be clearer. It is further added, that as no incision in the skin could be discovered, the probability was that the liquor had been injected by the anus.

The peasants in the village of Martres concluding the body so wonderfully preserved must be the remains of a saint, carried it into the church, rang the bells, and committed all sorts of superstitious folly, carrying away the aromatics from the mummy, tearing the bandages and linen, and cutting the skin, and even extracting the lower teeth for reliques. The bishop of Clermont, the successor of Massillon, hearing of these extravagancies, ordered the body to be buried, and accordingly it was buried; but some of the authorities of Riom, whose jurisdiction extended to the village of Martres, ordered the saint's body to be disinterred, conveyed it to Riom, and deposited it in the hospital of the town, enclosed in a case, part of glass, in the hopes that the strangers whom curiosity might attract would be liberal of their alms to the hospital. But very shortly after an order arrived from Versailles to convey the mummy to Paris, to be placed in the Cabinet of Natural History, and there it now is, but blackened, dried, hardened, and so much disfigured that those who saw it when first discovered could not know it again.

The Rationale of Speaking.—There seems to be an inveterate impression on the public mind, that the essence of statesmanship consists in the faculty of pouring forth an unlimited torrent of words; that he is the wisest and greatest politician who is the readiest, the most prolix, and most dextrous debater. Nothing can well be more erroneous than this conclusion. Speaking in public is a habit, and there are few men, wise or unwise, who could not become ready speakers by practice. It is true, that among men equally trained and accustomed to the public expression of their opinions, a difference in point of fluency may generally be observed: some possess the faculty in an extraordinary degree, while others are as remarkably deficient in it; but if we examine into the qualities of mind which are the causes of this difference, we shall probably discover nothing to establish a connection between soundness of judgment and fluency of speech. Facility of expression appears to depend very much on the predominant mode in which the ideas are associated. If an individual's thoughts are principally connected together by circumstances of time and place and superficial resemblance, by those casual ties, in a word, which usually prevail in the mental trains of people little accustomed to reflection, he possesses within himself the chief elements of a great talker. One idea perpetually suggests another, and as they all seem equally dependent, and there is no reference to any particular point on which the whole series is to be brought to bear, or at all events a very loose reference, no cause exists why the speaker should terminate his oration, except what the impatience of his audience supplies; or except, perhaps, the failure of his own physical strength. On the other hand, if a speaker's ideas on any subject rise in his mind because they are logically dependent, because they are strictly connected with the question before him, they are self-circumscribed within determinate bounds; a few words will frequently be sufficient to present them to the hearer; and as every thought will have a bearing on the conclusion intended to be proved, the process will naturally be brief.—*Bailey's Rationale of Representation.*

RICE.

Ory'za is the name by which rice was known to the Greeks and Romans, and which has been adopted by botanists as the generic name of the plant yielding that valuable grain. The Greek name would appear to be derived from the Arabic *Aruz*, and this is allied to *Uri*, the Telinga name of cultivated sorts; but the Sanscrit names are *Unoo*, *Dhanya*, *Vrihi*; the wild kind being called *Nivara*, while the great tanks are called *erays*, in the Tamul language. The European names are evidently all derived from the same sources, but the name *paddy* is applied to the rice in its natural state, or before being separated from the husk. The natives of India call it *dhan* in this state, as well as the plant, and the rice itself is called *chanwul*.

The genus *Oryza* has two glumes to a single flower; palcæ two, nearly equal, adhering to the seed; stamens six, and styles two. Dr. Roxburgh describes two species: one, *O. sativa*, distinguished by its diffuse panicle; the other, *O. coarctata*, has the panicle contracted, the valvulets of the calyx subulate, and the leaves culm-clasping. This species is a native of the delta of the Ganges, and was first discovered there by Dr. Buchanan in 1796, but was not found to be applied to any use.

The common rice, *Oryza sativa*, unlike many long cultivated grains, is still found in a wild state in and about the borders of lakes in the Rajahmundy Circars, though never cultivated, because the produce is said to be small compared with that of the varieties in cultivation. The grain is, however, remarkably white, palatable, and reckoned very wholesome; hence it is carefully gathered, and sells dear. The rich esteem it a dainty, and, to make it still more delicate, boil it only in steam.

The rice plant is therefore an undoubted native of India, from which country it has spread over a great part of the world, especially in Asia, where it forms the principal portion of the food of the inhabitants, but it has also from very early times been introduced into the southern parts of Europe. Theophrastus describes it in book iv., c. 5, with other Indian plants, and mentions it as growing in water, and that its inflorescence is like that of milium or panicum, and not in form of a spike. Adam Smith adduces it as one of the most prolific of grains. "A rice-field produces a much greater quantity of food than the most fertile corn-field. Two crops in the year, from thirty to sixty bushels each, are said to be the ordinary produce of an acre." Rice is now extensively cultivated in North and South Carolina, and in Georgia; also in Italy and the south of Spain, and likewise a little in Germany. The perfect system of irrigation and tillage which was introduced into Italy at so early a period no doubt rendered the cultivation easy, as the climate is also sufficiently hot and regular.

As the summer temperature of many countries is high, it is easy to cultivate an annual like rice, where water is abundant and irrigation easy; but as the summer temperature of most European countries is too low, and not long enough continued, and far from regular, it is hopeless to attempt the culture of a grain which requires so much heat, and which has the disadvantage, from the moisture arising from irrigation, of making a country unhealthy; but this is not the case in the rainy season of tropical countries, where the rice-field is not much more moist than the rest of the country. Its culture has been attempted in England, and a small crop was raised near Windsor, on the banks of the Thames; and it has been hoped that the mountain rice, which is known to grow at considerable elevations in the Himalayan Mountains, might be suited to an English climate. This variety certainly requires a less degree of heat, but it seems to be forgotten that temperature is only one of the elements of climate, and that moisture may be supplied to a plant either by the soil or the atmosphere, and the latter may be moist when the former is comparatively dry. Rice is sown in the Himalayas only in places within the influence of the periodical rains, that is, from about the middle of June to the end of September. In some places it is irrigated, and in others it is not, but rain falls very frequently, and the air is almost always in a moist state, from being charged with moisture from the heated valleys, which is deposited on the mountains, when it reaches an elevation where it becomes cooled beyond the point of saturation. The temperature also is so uniform as not to vary 10° of Fahr. from 70° for three months. So in the Isle of France the mountain rice is cultivated only in the rainy season.

The rice so extensively cultivated throughout India (and the cultivation in China, as described by Sir G Staunton, is very similar) depends upon rain, or irrigation either from rivers or tanks. These Capt. B. Hall ('Frag. of Voyages,' vol. iii., p. 18) describes in one situation, near Nundydroog, as spread over a valley, which was from six to eight miles across, and that they were used for irrigating myriads of rice-fields. The embankments are sometimes miles in length, and then of a waving snake-like shape. One valley was pointed out to Captain Hall, about a mile broad and forty miles long from end to end, which included between thirty and forty tanks, every intermediate square yard of the intermediate spaces being richly cultivated, while the surrounding country appeared to be condemned to perennial sterility.

Dr. Roxburgh states that he never saw or heard of an Indian farmer manuring in the smallest degree a rice-field; yet these fields have probably for thousands of years continued to yield annually a large crop of rice, on an average from thirty to sixty fold; even eighty or a hundred has been known. The best rice-fields are extensive open plains through which large rivers pass. The soil is generally of good depth; the best are those annually overflowed by the inundations, from which they necessarily receive some fertilising matter; but the greatest part of the rice-lands depend on the rains only, and receive no help except from it and the air. The varieties of rice are innumerable; forty or fifty at least are described. They are divided by Dr. Roxburgh into two kinds: one, called in Telinga, *Poonas* (Sans., *Asoo*), is sown thick in June or July, and transplanted in about forty days, when the plants are from nine to eighteen inches high; the fields are then kept constantly wet, more or less flooded, as some sorts require very little water, while others require a great deal. When the grain is ripe, the water is drained off, and the crop cut down with the sickle; it is either stacked or trod out by cattle. The grain is preserved in pits dug in high ground and lined with the rice-straw. The straw is stacked by the careful farmer for feeding his cattle during the hot weather.

The second division of cultivated rice is called *Pedder Worloo* by the Telingas. The grains are awnless, and both the unhusked and husked rice, in most varieties, are white and of excellent quality, though some require much water. In other parts of the country rice is divided, according to the seasons in which it is reaped, into that which ripens in the hot weather of spring, in the summer, or in the winter.

Buchanan states that two crops in the year from the same land do not yield much more than a single good crop would. But the seasons are so uncertain, and the latter crop so liable to fail, that they cultivate as much as possible for the first crop. This is reaped in the rainy season, when the straw cannot be preserved, and as rice-straw is almost the only food which the cattle have in many districts, there is an absolute necessity for sowing the second crop for fodder.

Rice is no doubt the grain which yields food for the largest portion of the human race, but even in India great numbers do not eat rice; in fact, in all the north-western provinces wheat is the principal crop, and the natives eat

wheaten cakes, and have rather a contempt for rice-eating districts. It abounds, however, in nourishment, being composed almost entirely of fecula, that is, 96 per cent., and therefore cannot be baked into bread; but it is more easily cooked. It is light and wholesome, and easily digested, and might form a much larger portion of the diet in Europe than it does. Europeans in India eat it at breakfast as well as at other meals, and with fish as frequently as with their curries.

a *b*

a, panicle of the rice plant, with ripe grains; *b*, a single grain, enveloped in its husk and awned.

Of the kinds imported into England, the Carolina is the best, and is grown in the marshy grounds of North and South Carolina. The grains are shorter, broader, and boil softer than the Patna rice, which is the best Indian kind known in this country, though in India there are several superior varieties, as, for instance, the Pilibeet, which are much more esteemed there. In the year 1838, 238,367 cwts. of cleaned and 218,207 cwts. of rough grain were imported into England. The quantity retained for consumption in the United Kingdom, in 1837, was 282,975 cwts.; in 1838, 289,063 cwts.; producing a duty in the former year of 25,327*l.*, and in 1838, of 24,606*l.* The consumption is in some measure influenced by the price of wheat. The relative values may be judged of by the price of the Carolina rice being 20*s.* when the Patna was 17*s.*, Bengal white 13*s* 6*d.*, and the Cargo only 9*s.* 6*d.* The Cargo is a reddish coloured, coarse, but sweetish grain, which is liked by the lower caste of natives of India.—*From the Penny Cyclopædia.*

The Natives of Tierra del Fuego.—The most remarkable traits in the countenance of a Fuegian are his extremely small low forehead, his prominent brow, small eyes (suffering from smoke), wide cheek-bones, wide and open nostrils, large mouth, and thick lips. Their eyes are small, sunken, black, and as restless as those of savages in general. Their eyelids are made red and watery by the wood smoke in their wigwams. The chin varies much: that of a Tekeenica is smaller and less prominent than that of an Alikhoolip, in whom it is large and rather projecting, but there is much variety. The nose is always narrow between the eyes, and, except in a few curious instances, is hollow in profile outline, or almost flat. The mouth is coarsely formed (I speak of them in their savage state, and not of those who were in England, whose features were much improved by altered habits and by education): their teeth are very peculiar; no canine or eye teeth project beyond the rest, or appear more pointed than those; the front teeth are solid, and often flat-topped like those of a horse eight years old, and enamelled only at the sides; the interior substance of each tooth is then seen as plainly, in proportion to its size, as in that of a horse. Their hair is black, coarse, and lank, excepting the few instances mentioned below. It grows by single hairs, not by piles, or by little bunches like very small camel-hair pencils. It does not fall off, nor does it turn grey until they are very old. Little, if any, hair is seen on the eyebrow. They would have a straggling beard, but scrupulously pull out every hair with tweezers made of mussel-shells.

When discovered by strangers, the instant impulse of a family is to run off into the wood. After a short time, if nothing hostile is attempted by the intruders, and if they are not too numerous, the men return cautiously, making friendly signs, waving pieces of skins, rubbing and patting their bellies, and shouting. If all goes on quietly, the women frequently return, bringing with them the children; but they always leave the most valuable skins hidden in the bushes. This hasty concealment of seal or otter skins is the result of visits from sealers, who frequently robbed families of every skin in their possession, before the natives understood the motives of their expeditions in boats into the interior waters of Tierra del Fuego. Sometimes nothing will induce a single individual of the family to appear; men, women, and children hide in the thick woods, where it would be almost impossible to find them, and do not show themselves again until the strangers are gone; but during the whole time of their concealment a watchful look-out is kept by them upon the motions of their unwelcome visitors.

Scarcity of food, and the facility with which they move from one place to another in their canoes, are, no doubt, the reasons why the Fuegians are always so dispersed among the islands in small family parties, why they never remain long in one place, and why a large number are not seen many days in society. They never attempt to make use of the soil by any kind of culture; seals, birds, fish, and particularly shell-fish, being their principal subsistence: any one place, therefore, soon ceases to supply the wants of even one family.

In a few places, where the meeting of tides causes a constant supply of fish, especially porpoises, and where the land is broken into multitudes of irregular islets and rocks, whose shores afford an almost inexhaustible quantity of shell-fish, a few families may be found at one time, numbering altogether among them from twenty to forty souls: but even those approaches towards association are rare, and those very families are so migratory by nature, that they do not remain many months in such a spot, however productive it may be, but go wandering away among the numerous secluded inlets or sounds of their country, or repair to the outer sea-coast in search of seals, a dead whale, or fragments of some wrecked ship. During the summer they prefer the coast, as they then obtain a great quantity of eggs and young birds, besides seal, which come ashore to breed at that season; and in the winter they retire more into the interior waters in search of shell-fish, and the small but numerous and excellent fish which they catch among the sea-weed (kelp).—*From Darwin's Voyages of the Adventure and Beagle, under Captains King and Fitzroy.*

Discourse.—He that questioneth much shall learn much and content much; but especially if he apply his questions to the skill of the persons whom he asketh, for he shall give them occasion to please themselves in speaking, and himself shall continually gather knowledge.—*Bacon.*

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THE RELIGIOUS MENDICANTS OF THE MOHAMMEDAN COUNTRIES.

Santon and Disciples.]

The Santons, or saints, of Arabia, Persia, Turkey, &c. form a numerous and peculiar class, corresponding in many points with the Religious Mendicants of Europe, although they do not, generally, like the latter, possess establishments for residence or support. They are known under different names, as Fakers, Derwishes, &c. (the former being generally used in Arabia, and the latter in Persia and Turkey), and are in many points of precept and practice dissimilar, but they may all be characterised as persons professing to lead a life of poverty and sacrificing all considerations of temporal interest, in order that they may the more exclusively devote themselves to spiritual matters. In some parts their influence is very great, extending not merely among the people, but also penetrating into the most important affairs of government, some of the chief offices of which, indeed, have been filled by them. Thus, Ali Bey* writes, "The two greatest saints of all the empire of Morocco are Sidi Ali Benhamét, who resides at Wazein, and Sidi Alarbi Benmáte, who lives at Tedla. These two saints decide almost on the fate of the whole empire, as it is supposed that they attract the blessings of heaven on the country. The departments which they inhabit have no Pasha, no Kaïd, or governor of the sultan; the inhabitants of them pay no kind of tribute, and are entirely ruled by those two saints under a kind of theocracy. The veneration which they enjoy is so great, that upon occasions when they visit the provinces, the governors take their orders and advice. They preach submission to the sultan, domestic peace, and the practice of virtue. They receive considerable presents and alms, and there is not a woman in the empire that would not seek an occasion to consult with them when they come within reach. Upon such religious excursions, they are followed by a crowd of poor, who sing the praises of Allah and of all holy personages. A number of armed men are continually in their retinue, and ready to defend the divine cause with their weapons." He adds, that "this holiness is hereditary in some families." He mentions various incidents in connection with some of these saints, which show clearly enough that the main body of them are mere hypocrites living upon the credulity of the people.

Of the respect paid to the Santons in Egypt, Savary, in his 'Letters' on that country, gives testimony. He went with some Arabs to visit one of these holy men. He says, "Away they went and I following, passed the second pyramid, and stopped with them at the door of a grotto cut in the rock, into which, pulling off their shoes, they went. I was the only European who imitated them. The grotto was spacious, clean, handsome, and very cool. At one end was a niche, six feet high, before which an old curtain with many holes was drawn. The Arabs came near with reverence; each kneeled in turn, and kissed a foot which was held out under the curtain. My turn being come, I approached, and said, 'O holy Saint, show me thy face.' My compliment was taken as an insult, and judging by my pronunciation that I was not an Arab, he answered surlily, 'Leave me, dog.' Hearing this, the Mussulmen looked furiously at me, and I hastily went away; happy that my imprudence had no

* 'Travels of Ali Bey in Morocco, Tripoli,' &c., 1816.

worse consequences, and promising never more to hold conversation with an Egyptian Santon."

Among the particular orders into which these religious mendicants are divided, may be mentioned the Holy Idiots, the Manlavîs, the Rhufûïs, and the Calenders. The first are notorious for their indecent disgusting practices (such as appearing naked in public, &c.), which they are allowed to continue with impunity on account of their supposed sanctity and aberration of intellect. The Manlavîs, founded by the celebrated Persian Palt Jelâleddîn Rûmî, are the most numerous in Turkey, where they possess two great monasteries, one at Galata and another at Iconium. There are also convents of this sect in nearly all Mohammedan countries, which serve as inns to travelling pilgrims. It is the order of the Manlavîs which practises the peculiar dance for which the Derwishes are famous. At the sound of a pipe they begin to turn round with astonishing velocity, and, when the pipe ceases, stop at once, without exhibiting marks of giddiness. Some of these persons amuse the people by a display of tricks of legerdemain and sorcery. This is the only order which requires a vow of chastity, and that only for the time during which the individual remains attached to it. The Rhufûïs are distinguished for the excesses of personal mortification and suffering their fanaticism induces them to subject themselves to. For instance, in their weekly assemblages in the halls of the convents, some are selected to hold a piece of red-hot iron between their teeth till it cools; others to make deep incisions in their bodies with sharp instruments. The origin of the Calenders is thus described by Knolles, in his 'History of Turkey.' "In the time of Mohammed there lived a certain Santone, who always mentioned the name of God with the sound of his pipe, and with that music recreated himself day and night, not after a cheerful and merry humour, but with sad and melancholy tunes; accompanying his pipe with tears and sighs. He was an excellent musician and a deep philosopher, endued with those supernatural virtues as enabled him to work miracles clearly and notorious to all the world. He was a hermit, called in Arabic, Abdal, went with his head bare, and, his body full of wounds, without a shirt or other clothing besides a skin of some wild beast thrown about his shoulders. At his girdle he wore some fine polished stones; on his wrists, instead of diamonds and stones of value, he wore counterfeit jewels which carried a lustre and fair appearance with them. This man was called Santone Kalenderi; who was continually singing Arabic sonnets, and according to their musical airs; making also harmonious compositions so artificially that he seemed another David. But however staid and sober this Santone was, his disciples and proselytes are of another temper; being wholly given up to jollity and delights, they banish all kinds of melancholy and sadness, and live free of cares, passions, or torments of the mind, and have their saying among them:—'This day is ours, tomorrow is his who shall live to enjoy it;' and therefore studiously attend to lose no moment or least part of their pleasure, but consume their time in eating and drinking; and to maintain their gluttony they will sell the stones of their girdles, their earrings, and bracelets. When they come to the house of any rich man or person of quality, they accommodate themselves to their humour, giving all the family pleasant words and cheerful expressions, to persuade them to a liberal and free entertainment. The tavern is by them accounted as holy as the Mosque, and they believe they serve God as much with debauchery or liberal use of his creatures (as they call it), as others with severity and mortification." He also says, "The order may rather be termed the sect of the Epicureans, than men retired to mortify their appetites and deny the world; as all other of the religious and regulated Turks pretend." Chardin, in his work on Persia,* bears similar testimony to their habits in that country, and describes very fully their appearance, which is chiefly remarkable for the singular and fantastic dresses they wear in order to excite attention, or impress upon the minds of the ignorant and superstitious still deeper feelings. Some wear party-coloured clothes put together in the most absurd fashion; others, in imitation of their founder, tiger or sheep skins, with lamb-skin on their head, whilst others go half naked; and to exceed even these, in the backward race toward barbarism, others paint their skins red or black. By these appearances they profess to display one his voluntary poverty, another his contempt for the vanities of the world, another the extent to which he can carry the mortification of his worldly appetites, a fourth the elevation of his spirit, and so on. Some Calenders wear feathers fixed erect on the ear, and the head is generally covered in some peculiarly ridiculous manner. They carry in their hands either a great stick, a hatchet, or a naked sabre, and have a wooden bowl attached to the girdle to receive alms. Their custom with strangers is to force upon them for acceptance a fruit, a flower, or some such trifle, and then to let them know that they expect a gratuity of far higher value in return. Nor after having thus committed themselves, is it safe to refuse their demand. They preach whenever and wherever the impulse seizes them, in the mosques, the coffee-houses, or in the squares. By the use of opium and intoxicating liquors, they work themselves up into a kind of delirium, when they profess to be inspired like the ancient prophets. Generally speaking, all these religious orders are falling into disrepute with the more educated classes of the communities among which they reside, it being considered that the garb of sanctity is but too commonly worn as a cover for idleness and profligacy.

* 'Voyage du Chevalier Chardin en Perse.'

USEFUL PRODUCTS OF THE WHALE.—No. II.

In our last paper on this subject we described the mode in which the blubber is packed in casks on board the whale-ships. When the ship arrives at port, say Hull, the cargo is discharged, and, generally speaking, the boiling-houses are situated very near the spot where the casks are landed.

The blubber, which was originally in the state of firm fat, is found to have become, by the effects of a long voyage, partially resolved into oil. The casks are hoisted into the boiling-houses by a crane, and the bungs being removed, the contents of the casks are emptied into a large wooden cistern elevated six or eight feet from the ground. As much is emptied into the cistern at one time as will suffice for one boiling. On opening a stop-cock or a valve, the whole contents fall into an immense copper boiler placed at the side and a little beneath the cistern. This boiler is of an elliptical shape, and has a capacity of from three to ten tons. A brisk fire is applied beneath the boiler, and kept up until the whole contents boil, which occurs in about two hours. During the whole of this time the contents are incessantly stirred, to keep the sediment from adhering to the boiler. It is allowed to boil for a very short time, and then the fire is slacked, and the oil allowed to cool gradually for seven or eight hours.

Near the boiler are placed several large shallow vessels called coolers. Into these coolers the oil is allowed to flow from the boiler, by means of a valve or cock in the side of the latter, and a pipe or spout leading therefrom to the cooler. A kind of sieve or filter of brush-wood is placed in the pipe, so that the oil becomes clarified in passing through it. When the oil has flowed out to a certain depth, the remainder is carefully laded or skimmed up, so as not to interfere with the sediment beneath. This sediment consists of the membranous tissue forming the little cells in the blubber, as also refuse matter of other kinds. From 250 gallons of blubber there usually result

rather less than 200 of oil, the remainder being solid impurities. The sediment is taken from the bottom of the copper and thrown into a pit, where, after a time, a little oil rises to the surface: this is skimmed off, and the remainder, under the name of fenks, is found to be an excellent manure. A rich manure, known by agriculturists as "Meadowbank compost," is formed of fenks mixed with peat moss, as recommended by the late Lord Meadowbank.

The oil is allowed to remain undisturbed in the coolers for twenty-four hours, by which it becomes quite cold and fit for use. The coolers being elevated above the ground, casks are placed beneath, and a stop-cock in the cooler being opened, the casks are easily filled: these being carefully bunged up, are fit for the market.

Such being the principal details relating to the oil, we proceed to the whalebone. We stated in the last paper that it is shipped in pieces called junks, consisting of eight or ten blades each These blades are separated from one another and cleaned and prepared near the premises where the oil is extracted. The gum attached to each blade being cut off, the blade is put into a cistern of water, to soften the dirt. This done, it is taken out and placed on a plank, and scoured with sand and water by means of a brush. It then passes to another person, who scrapes the surface smooth at the part where the gum was attached. The fringe of hair attached to one edge of the blade is then cut off with a pair of shears. It is then washed in clean water, and, when dry, finally polished with brushes and hair-cloth. The pieces of whalebone are packed in portable bundles of about a hundredweight each, and removed to the warehouse. All blades measuring six feet and upwards in length are called "size" bones; all beneath that length are called "under-size;" and the former are sold at twice the price of the latter, on account of their greater utility in the arts.

The uses of whalebone in the arts are very numerous, arising principally from its flexibility, hardness, and durability. Its uses will be better understood by considering its structure; for every blade of whalebone consists, internally, of a fibrous substance somewhat resembling stiff hair, and externally of a black or whitish smooth enamel-like substance. Whalebone was first brought to England about 250 years ago, and was found so useful as a stiffening material for ladies' stays, that the demand became very large. As much as 100,000*l.* per annum has been paid to the Dutch for a supply, before the English embarked extensively in the fishery. The price has varied from 50*l.* to 700*l.* per ton, according to the relation between supply and demand, and also to the quality. Within a few years, the employment of whalebone in the manufacturing arts has been more extensive than as a material in stays; for steel busks are now greatly preferred by the ladies for the latter purpose. Many of the useful applications of whalebone depend upon this circumstance, that when softened in hot water or heated before a fire, it will retain any shape that may be then given to it, provided it be secured in the required form until cold. The central fibres, when separated and curled, are capable of being used in the stuffing of mattresses, &c. The hair which is cut from the edge of the whalebone is also used in stuffings for chairs, sofas, settees, carriages, mattresses, cushions, &c. The black enamel-like surface is sometimes used as a substitute for cane in the construction of the seats or backs of chairs, gigs, sofas, &c. The white portions, sometimes found on the surface, are split into narrow strips, and fabricated into ladies' bonnets, hats, and a variety of ornamental surfaces. Split whalebone has also been used for the bottoms of sieves, for horses' girths, for webbing, for the hairs of brushes and brooms, for some of the parts of portmanteaus and travelling trunks, for fishing-rods, for the ramrods of fowling-pieces, for the shafts, springs, &c. of carriages. A large quantity is used for the ribs of umbrellas. Hygrometers are sometimes formed of it. Attempts have been made to build whale-boats of this material; but it is so liable to expansion and contraction by changes in the weather, that this mode of employing it has been found unavailable. These details will show how valuable a material whalebone has become in our manufactures.

Another important product of the whale, viz. spermaceti, has been yet scarcely alluded to. It is found in a different species of whale from that which yields whalebone. The sperm whale is found chiefly in the South Seas, and the fishery is generally of far longer continuance than that of the Greenland whale. We need not describe the anatomical differences between the two species of whale, but shall merely confine ourselves to that peculiarity in the sperm whale connected with the secretion of spermaceti. "In the right side of the nose and upper surface of the head is a large, almost triangular-shaped cavity, called by whalers the 'case,' which is lined with a beautiful glistening membrane, and covered by a thick layer of muscular fibres and small tendons, running in various directions, and finally united by common integuments. This cavity is for the purpose of secreting and containing an oily fluid, which, after death, concretes into a granulated substance of a yellowish colour, the spermaceti. The size of the 'case' may be estimated, when it is stated that in a large whale it not unfrequently contains a ton, or more than ten large barrels of spermaceti."* What purpose this peculiar substance fulfils in the animal is not known: the only effect at present perceived is, that by its specific gravity being less than water, the head of the animal is rendered more buoyant.

The capture of the sperm whale, the lashing to the ship's side, and the cutting off the blubber, are effected nearly in the same manner as with the Greenland whale. To procure the spermaceti is a separate process. The head of the sperm whale is cut off before the blubber is cut, and allowed to float astern of the ship until the other operations are completed. The head is then hoisted upon end, the "case" opened, and the fluid spermaceti drawn from it by means of a bucket and pole, the pole being used to force the bucket down into the "case," to procure the valuable contents. When emptied, the head is let go, and speedily sinks in the sea.

From the fluid spermaceti thus procured an oil is allowed to drip, and the remainder is brought to England in barrels. The mass, when unpacked, is purified in the following manner:—It is put into hair or woollen bags, and pressed between plates of iron in a screw-press until it becomes hard and brittle. It is then broken in pieces and thrown into boiling water, where it melts, and the impurities are separated from it. After being cooled and separated from the water, it is put into fresh water in a large boiler, and a weak potash ley is added to it. This process is repeated two or three times, after which the whole is poured into coolers, by which the spermaceti concretes into a white semi-transparent mass. This mass, on being cut into small pieces, presents the flaky appearance with which we are familiar in spermaceti.

Spermaceti is extensively used in the manufacture of candles, since it burns with a clear white flame, and without any disagreeable odour. Its use as a medicine is not now of much importance. Dr. Thomas Brown, a physician of the seventeenth century, says that "the combers of wool made use hereof; and country-people, for cuts, aches, and hard tumours. It may prove of good medical use, and serve for a ground in compounded oyls and balsams." After this it was used largely, both for internal and external complaints; but at present it is very little used, except in the preparation of spermaceti ointment. This substance (the unguentum cetacei) is formed by melting together, over a slow fire, six drachms of spermaceti and two drachms of white wax,

* Beale, 'Natural History of the Sperm Whale.'

and stirring them constantly till cold. The external use of this ointment is familiarly known.

Another substance found in the sperm whale is ambergris. It was long undecided what was the source of this production, which has frequently been found floating on the surface of the sea; but it is now known to be a concretion within the body of the whale. It is extensively used as a perfume, particularly in Oriental countries. It is also used in some countries as a kind of spice, and also in medicine.

We have now enumerated the principal purposes for which whales are captured, and it will be seen that the products are very valuable. There are, however, other uses of a minor kind. The oil obtained from the blubber, besides its use for lamps, is employed in the manufacture of soft soap, in the preparation of leather and of coarse woollen cloths, in the manufacture of coarse varnishes and paints, in the preparation of ships' ropes, &c. Coarse whale-oil is also extensively employed in the manufacture of oil-gas and of lamp-black.

The tail of the whale, besides being employed as a chopping-block on board the whalers, is also capable of yielding a little oil; and its tendinous fibres are capable of being converted into glue, and are extensively used in the manufacture of this article in Holland. The jaw-bones are frequently used as ribs for sheds, and in the construction of arches and ports of gateways. The external part of these bones, being harder and of a more compact texture than the interior, is applied to the formation of the sheeves of blocks in place of the hard wood called lignum-vitæ. Any of the bones, when ground into powder, forms a valuable ingredient in manure.

The mighty monster of the deep is thus seen to be fully worthy of the attention which has been paid to him, and the importance attached to his capture.

Markets and Currency in Borneo.—One of the most striking singularities at Bruni is the floating market, composed of a multitude of canoes, which ply along the lines of buildings and from one side of the river to the other. In most places the buyer must go to the market, but here the market comes to the buyer, and he realises all the advantage of choice and competition without stirring a step from his door. The medium of exchange is usually large pieces of bar-iron, without any stamp or superscription upon them, every man being at liberty to have a mint under his own roof.—*Notes of Voyages from Canton.*

The Vital Principle.—On tracing living beings to their origin, the naturalist learns that every individual vegetable and animal takes its rise from an atom of imperceptible minuteness, and gradually increases in bulk by successive accretions of new matter, derived from foreign sources, and by some refined but unknown process transmuted into its own substance. Then, following the progressive development of the organs, he observes them undergoing various modifications, as they are assuming new forms, which characterise certain definite epochs in the general growth of the system. In a great number of instances, especially among the lower orders of animals, he witnesses the same individual being acting, in its time, a variety of different parts; often reappearing on the stage of life with new organs, new faculties, and new conditions of existence, and undergoing metamorphoses as complete as any that have been depicted in the fables of antiquity. The period at length arrives when the animal, having completed its growth, attains the maturity of its being and acquires the full possession of its powers. Every organ in succession has received its entire development, and has united its energies with those which had been before perfected. Yet, however complete the arrangements that have thus been established, it is still necessary, in order to preserve the whole system in a state in which it may be capable of exercising the functions of life, that the materials which compose its fabric should undergo a certain slow but constant renovation; and the same circle of actions and reactions which have brought it to its state of perfection must continue to be repeated, in order that a due proportion may be maintained between the consumption and the supply of these materials. In the course of a certain time, however, even under the most favourable circumstances, this equilibrium begins to fail, the energies of the system decline, and the processes of nutrition are insufficient to repair the waste in the substance of the body. The fluids are dissipated faster than they can be renewed; the channels through which they circulate are more and more obstructed, and at length cease to be pervious; and the solids gradually become hard and rigid. As in a machine in which the wheels are worn and the springs have lost their elastic force, so in the animal body, at an advanced age, the slightest additional impediment that occurs will stop the movements of the whole system; and, when once stopped, their renewal is impossible. Nature has thus assigned to every living being a certain period as the utmost extent of its duration. Even when exempt from external interference, all are doomed to perish, sooner or later, by the slow but unerring operation of the same internal causes which originally effected their development and growth, and which are inseparably interwoven with the conditions of their existence.—*Dr. Roget's Bridgewater Treatise.*

The Lagoon Islands of the Pacific Ocean.—The annular reef of this lagoon island [Keeling] is surmounted in the greater part of its length by linear islets. On the northern side there is an opening, through which vessels reach the anchorage. On entering, the scene was very curious and rather pretty: its beauty, however, being solely dependent on the brilliancy of the surrounding colours. The shallow, clear, and still water of the lagoon, resting in its greater part on white sand, is, when illuminated by a vertical sun, of a most vivid green. This brilliant expanse, several miles in width, is on all sides divided, either from the dark heaving water of the ocean by a line of snow-white breakers, or from the blue vault of heaven by the strips of land, crowned at an equal height by the tops of the cocoa-nut trees. As a white cloud here and there affords a pleasing contrast with the azure sky, so in the lagoon dark bands of living coral appear through the emerald-green water.

The next morning after anchoring, I went on shore on Direction Island. The strip of dry land is only a few hundred yards wide; on the lagoon side we have a white calcareous beach, the radiation from which in such a climate is very oppressive; and on the outer coast, a solid broad flat of coral rock, which serves to break the violence of the open sea. Excepting near the lagoon, where there is some sand, the land is entirely composed of rounded fragments of coral. In such a loose, dry, stony soil the climate of the intertropical regions alone could produce a vigorous vegetation. On some of the smaller islets, nothing could be more elegant than the manner in which the young and full-grown cocoa-nut trees, without destroying each other's symmetry, were mingled into one wood. A beach of glittering white sand formed a border to these fairy spots.

I will now give a sketch of the natural history of these islands, which, from its very paucity, possesses a peculiar interest. The cocoa-nut tree, at the first glance, seems to compose the whole wood: there are, however, five or six other kinds. One of these grows to a very large size, but, from the extreme softness of its wood, is useless; another sort affords excellent timber for ship-building. Besides the trees, the number of plants is exceedingly limited, and consists of insignificant weeds. In my collection, which includes, I believe, nearly the perfect Flora, there are twenty species, without reckoning a moss, lichen, and fungus. To this number two trees must be added; one of which was not in flower, and the other I only heard of. The latter is a solitary tree of its kind in the whole group, and grows near the beach, where, without doubt, the one seed was thrown up by the waves. I do not include in the above list the sugar-cane, banana, some other vegetables, fruit-trees, and imported grasses. As these islands consist entirely of coral, and at one time probably existed as a mere water-washed reef, all the productions now living here must have been transported by the waves of the sea. In accordance to this, the Flora has quite the character of a refuge for the destitute: Professor Henslow informs me that, of the twenty species, nineteen belong to different genera, and these again to no less than sixteen orders!—*From Darwin's Voyages of the Adventure and Beagle, under Captains King and Fitzroy.*

THE NEWCASTLE IMPROVEMENTS.—No. IV.

[Continued from No. 516.]

[Grainger Street.]

The stranger in Newcastle is, reasonably enough, struck with astonishment at the first sight of Grey Street. But for one feature, it might be taken for an avenue of palaces, which it had taken a century to erect. This feature is one which the architect could not help; the ground-floor fronts, being of glass, offend the eye, from their appearing a very inadequate support to the pile of building above. Grey Street, however, is a street of business, and must present a range of shop-windows: and the architect has done all he could in making his windows of handsome plate-glass, and in making the shafts as solid and prominent as possible. The more this street is studied, the more it strikes the imagination. That this row of shops, warehouses, and inns, sprung up within three years, should offer to the eye the same impression with a line of palaces in Vicenza, is a wonder which may well excite and sustain admiration.

The erections which compose Grey Street, and the eight other new streets, are of a perfectly uniform colour, and all the decorations are of solid stone. The advantage that Grey Street has over Regent Street is, not only in the richness of its architecture, but in the value and beauty of the material employed,—in the superiority of the fine stone of the neighbourhood over brick faced with stucco. It has also greatly the advantage over the business streets of Edinburgh in richness and variety of design. It is 400 yards long, from 70 to 80 feet wide, and curvilinear in form. The houses are four lofty stories high, with a basement story of cellars. The sections formed by cross streets comprise separate uniform designs.

We will take first the west side of Grey Street, ascending, and afterwards the east.

The west side of Grey Street consists of three ranges of buildings. The lowest, from Mosley Street to the High Bridge, has for its centre the Branch Bank of England and the District Joint-Stock Bank: and for its wings the Newcastle Joint-Stock Bank and the Journal Newspaper Office. The architecture is Corinthian in character, and is derived from the interior of the Pantheon at Rome. The entablature of the centre front is supported by eleven fluted Corinthian columns, 25 feet in height, and the whole is surmounted by a double range of balustrades.

The second range, extending from the High Bridge to Market Street, has the Turk's Head Inn for its centre, with shops on each side. The whole compose a uniform design, after the temple on the Ilyssus at Athens. The Ionic columns are 22 feet in height.

The third compartment, between Market and Blackett Streets, consists of the east front of the triangle which comprehends the Central Exchange; about which a little more must be said.

We have mentioned before the delay about the erection of a Corn-market, and Mr. Grainger's having begun the Arcade at the request and for the service of the corn-merchants. When he had given up his design, on the understanding that the Corn-market opposite St. Nicholas Church was immediately to be proceeded with, Mr. Green's plans were all prepared and approved, and the way seemed open for the prosecution of the work. For six years more, however, the corn-dealers were exposed to wind and weather, in spite of their own and Mr. Grainger's desire that they should enjoy the advantage of a shelter. Again they applied to him, and again he set to work on their behalf. He erected a splendid Exchange, and offered it to the Corporation as a free gift, on condition of its being used as a corn-market. The owners of property near St. Nicholas Church interfered by claiming of the new Corporation the fulfilment of a pledge given by the old Corporation to contribute 9600*l.* towards the establishment of a market in the neighbourhood. Some advantage has arisen from the erection of the New Corn Exchange in the pulling down of a mass of ruinous

buildings: but it is rather astonishing to a stranger to see a building of no uniformity or beauty, fixed in a low situation, encroaching on one street, and fronting another which will be in parts only 40 feet wide, and to think that for this building, costing nearly 10,000*l*., was refused the free gift of that which we are about to describe. But the Corporation considered that there was no honourable escape from the pledge given by their predecessors.

There were purposes for which the new building was perhaps as much wanted as if it had been accepted for a corn-exchange. From the increasing size and population of the town, the opening of new railroads, and the progressive enlargement of the place, some general place of meeting, including a news-room, coffee-room, and a hall of conference, was really needed. To these purposes Mr. Grainger adapted his new building, and with entire success. We furnish a view of the Central Exchange, now so called, as it is considered remarkable for its ingenuity and convenience, as well as striking from its beauty.

The three fronts are upon Grey, Grainger, and Market Streets, and are uniform in design. They are of the Corinthian order, after the temple of Vesta at Tivoli. The three points of the triangle are finished by domes springing from ranges of Corinthian columns, each forming about three parts of a circle. This mass of building is perhaps the most conspicuous in the town, from its central situation and the uniformity of so extensive a design.

The casing of this triangle consists of shops and warehouses, enclosing the Central Exchange, which is therefore lighted altogether from the top. The interior measures 150 feet by 95 feet, and is a semicircle of 75 feet radius. There is in addition an oblong area of 20 fect wide and 40 feet high adjoining the diameter. The roof is supported by fourteen columns of the Roman Ionic style, twelve of these forming a semicircle within the room. These columns are 25 feet in height, the base and capitals painted white, and the shafts in imitation of Siena marble. The carpeted platform within these columns is occupied as the news-room. The wall which forms the diameter is adorned with pilasters of the same order as the columns.

In the centre of the larger semicircle is a recess, supported by columns of the same character, and containing the double flight of steps and entrance-door communicating with the coffee-room and other apartments. There are five entrances, and the doors are richly ornamented. The floor is tessellated, its materials being a highly-polished dark stone, relieved by white tiles. The latter were employed instead of marble, as being not less expensive, but supposed more durable.

We have said that the whole of this great building is lighted from the roof. This roof is formed of radiating principals springing upon a curved rib from the entablature, over each of the twelve columns which encircle the centre platform. A bold entablature, with a modillion cornice painted vein marble, and the frieze Siena marble, runs round the entire building. The effect of the whole on entering, from the beauty of its form and proportions, and the ample and advantageous light, is exceedingly striking. It was thought so by the strangers who thronged it during the meeting of the British Association, though the columns were then only the thin cast-iron pillars (intended for the Corn Exchange) built round and unpainted, and the proportions of the whole building were spoiled by the raised floor laid down for the occasion.

There are now above 1600 guinea subscribers to the Central Exchange—a number which shows how much such an establishment was needed in the town. The affairs of the news-room are managed by a committee of the subscribers, and Mr. Grainger remains the proprietor of the whole.

In his honour a public dinner of his townsmen took place within its walls on the day of the opening of the Central Exchange.

[To be continued.]

CHAR, AND CHAR-FISHING.

[From a Correspondent.]

This undoubtedly is one of the most delicious of fresh-water fish; and probably on account of its scarcity, or rather, perhaps, from the difficulty of taking it in the few and isolated locations in which it is found in our island, it is generally allowed to be the most esteemed fish that we have. These fish, however, do not afford much amusement to the angler, since the most dexterous of Old Izaak's disciples cannot, but to a very limited extent, allure them from their favourite haunts—the pure and transparent waters of the silent rocky deeps.

Char, Charr, or Charre, in Ichthyology, is the common name of the *Salmo Alpinus*. It may be remarked, that under the general term *Salmo* are classed many fish of excellent quality, several of them being common to this country, and at their head we have that prince of fish, the common salmon. As its name seems to imply (Salmo Alpinus), the char is an inhabitant only of Alpine regions; since in no case does it seem to belong to waters not immediately connected with rocky steeps and mountains. They are found in considerable numbers in some parts of the Lake of Geneva, as well as in some other lakes connected with the Alps; as also in many of the lakes in both Norway and Lapland, where, during the short summer, their principal food is the larvæ of the gnats that infest those wild regions in immense numbers. They are also found in some of the lakes of Siberia; but not, that we are aware of, in any of the numerous lakes of the continent of North America. In this country Windermere Lake is the most famed for its char. But this reputation probably is rather the consequence of the superiority of this lake generally, than of the excellence of its fish, since they are considered more abundant in Coniston Lake, where many of them are supposed to attain a somewhat larger size. Besides the lakes of Windermere and Coniston, they are likewise found in two or three other inferior pieces of water. Some of the lakes in Wales boast of their *Torgoch*, or red-belly, which is generally allowed to be the red char, though some writers appear to doubt it. Several of the Scotch lakes, too, can boast of possessing these delicate and beautiful fish; although they are more rarely seen there, from the absence of the practice of netting, and their general unwillingness to take a fly or any of the ordinary baits used in angling. However, since it became somewhat fashionable to make tours to the Highlands and lakes of Scotland, char have been taken in some of the numerous lakes, by those erratic anglers, where they were not known previously to exist at all. But the lakes of Westmoreland, and that portion of Lancashire lying north of the Sands, may fairly be considered as the chief locality for char in the United Kingdom; and though Windermere, as has been already stated, stands pre-eminent in the annals of char-fishing, Coniston Water, situated a few miles to the west of it, is a formidable rival.

In its shape this fish approaches that perfect symmetry for which many of the *Salmo* species are so very remarkable; not differing materially from the common trout, though, perhaps, a little more slender and tapering than a trout that is plump and well fed. The colour of the *red* char—for there is another variety called *case* char, and the fishermen would make out a third, which they call *gilt* char—may be described as follows: The head terminates in rather a blunt point, the under jaw scarcely at all projecting. The pupil of the eye is black, in a silver iris, surrounded with a circle of gold. The body is covered with very minute scales. The dorsal

fin, which is yellow, is marked with a few dark spots; the back is dark with a peculiarly beautiful greenish cast, shading into the most delicate white on the lower parts, and tinted with a bluish-like hue that is difficult to describe. All the fins, except the dorsal, are reddish; and during the season of spawning, the belly for the most part becomes as red as the fins. The body all over is sprinkled with pale spots, of a considerable size for so small a fish.

There seems no doubt of there being two distinct varieties found in Windermere and the neighbouring lakes, though in appearance there is but little difference, and less still in the quality of the fish. But the *case* char spawn in the latter part of September and during the month of October; while the *red* char do not spawn before the latter part of December and the beginning of the new year; and even sometimes so late as February. By the term *gilt* char (which is a provincial term for barren) the fishermen allude to such as they conceive do not spawn at all, and, consequently, they consider them always in season. It is the case char alone that ever leave their haunts in the deep blue waters—even in the spawning season, and ascend, for a short distance, some tributary stream; for char, like all the *salmo* fraternity, are very particular in selecting their spawning-ground.

At the upper end of Windermere, near the town of Ambleside, a considerable stream or feeder enters the lake. A short distance above where it does so, it is separated into two branches,—that towards the left hand (in ascending the stream) is called the Brathay, and the right-hand one the Rothay. The former, or left-hand one, derives its source from the narrow valleys among that rugged cluster of mountains called Langdale Pikes; and finds no gulf or pool to repose in along its lively and rapid course; while the Rothay, from its source downwards, slumbers awhile in the two lakes of Grassmere and Rydal. Now the char, in ascending a short distance to spawn, on reaching the confluence of the two streams above named, *invariably* turn to the left, and wholly avoid that branch which has slumbered for a season in the lakes of Rydal and Grassmere. A few char occasionally enter the mouth of another small river, a noted trout stream—as its name seems to imply, called Troutbeck,—but do not proceed far up it; though numbers of them deposit their spawn where it discharges its waters into the lake. It is worthy of remark, that this stream does not pass through any lake on its way to Windermere.

The *red* char deposit their ova along the shallower parts of the lake near the shores, where there is a gravelly bottom; and many of them are supposed to do so near to the outlet, a short distance from Newby Bridge.

On account of these interesting and valuable fish, some sections of both Windermere and Coniston lakes rent pretty high as fisheries; and although they do not yield any great quantities, the price these fish command in the market commonly remunerates, in a moderate degree, the persons employed in the fisheries. The common size of the Windermere char certainly does not, on the average, equal half a pound each: some few are caught that weigh a pound, or something more; but, probably, six ounces would be nearer the average weight of those that are annually taken. On account of their small size, it will at once appear obvious that they are not well adapted for being dressed and brought to table, in the ordinary way, that is boiled,—neither are they commonly broiled or dressed as a pan fish, and, when they are so, they are scarcely, if at all, superior to good trout. They possess a flavour, however, that connoisseurs seem greatly to admire; and the flesh when dressed has a rich and inviting appearance; being beautifully flaky, and of a deep orange tinge. But the general way of dressing these fish is that of potting—that is, seasoning them with certain condiments after they have been stewed and the bones taken out, and afterwards placing them in courses in shallow pots (hence *potting*), of 7, 8, or 9 inches in diameter, and pouring the finest melted fresh butter over the fish until they are well covered, and thus secured from the action of the air. They are so highly seasoned, that with this simple covering of butter, the pots containing the char may be sent to any part of the kingdom, and the fish will remain untainted for some months. This enables the persons connected with the char fisheries to send them to the best markets, our luxurious metropolis being undoubtedly at the head of the list. They are usually sold in half-guinea and guinea pots.

Disavowing all malice or ill-will towards the char-potters of Bowness, Ambleside, Coniston, and others in the vicinity of those lakes where this profitable business is carried on, I cannot abstain from stating that which I know to be an undeniable fact, namely, that in many cases a smaller quantity of char is mixed with a larger quantity of trout, or some other inferior fish, and the adulterated pots then sold as genuine char. This is only, it is urged, a common trick with most *manufacturers*, and not considered any serious imposition to substitute a few nice plump trout in the place of as many char. An acquaintance of mine, who resided on the banks of Windermere, and who possessed opportunities of ascertaining the produce of the fisheries in *real* char, as well as the quantities exported from thence, in pots alone,—amused himself with making calculations, and the result was, that he found nearly three times the quantity exported that were actually caught.

Except in the spawning season, the common haunts of these fish are in the clear and deep water; and the usual way of taking them is in sunken nets, or trammels, as they are called, which are furnished with bait to allure the fish; and which sometimes remain set for several days before any of them are enticed into the snare. Their haunts are generally badly calculated for employing drag nets, on account of the rocky nature of those lakes. It has already been stated that these fish do not afford the angler much amusement; nevertheless they are now angled for far more than they formerly were. An expert angler, however, may think himself fortunate if he succeed in killing more than a dozen during the day. They are occasionally allured to the surface by a tempting artificial fly; but trolling with a small minnow several feet below the surface is a more likely mode of not being forced to leave the fishing-ground with an entirely empty fishing-basket. Since the tastes and habits of the char appear to be similar wherever they are found—it will be unnecessary more particularly to refer to those found in the lakes of Wales and Scotland.

Whoever has made the tour of the Westmoreland and Cumberland lakes will probably remember that remarkable mountain called Coniston Old Man; since few persons visit the straggling village of Coniston and the adjoining placid lake, that do not ascend, or feel a desire to ascend, this majestic and lofty mountain, which rises above the village and the upper end of Coniston Water. Viewed from the east and the south, the Old Man appears to stand alone; but this is by no means the case, since towards the north and north-west it is backed by other rugged mountains, many of them but little inferior to itself in altitude. The huge body of this mountain seems to be composed principally of slate, of the light-blue kind; there being several slate-quarries, or rather mines, nearly half way towards its summit. Immediately on the west side of this hill, in a lone and romantic amphitheatre, is a small lake, or *tarn*, called Gates Water Tarn, at a considerable elevation above the level of Coniston Lake, its water appearing of inky darkness, being overshadowed on one side by the Old Man, and on the opposite one, by an overhanging and tremendous rocky precipice. Huge pieces of rock, that have rolled down from the upper declivities of the mountains from time to

time, appear to have filled up a considerable portion of the original gulf; and, from appearances, there seems no doubt but that the slow yet sure course of time is ever adding more fragments to the already accumulated mass. This, it may readily be supposed, renders the waters of this romantic lake difficult of approach; but towards the northern extremity there is a single place comparatively free from the incumbrance of rocks, and the water's edge may be approached without any difficulty. It is a general remark, that char are rarely found in small lakes, but it was accidentally discovered, at a somewhat recent period, that this little Alpine reservoir was inhabited by these celebrated fish. Laborious and fatiguing as is the route from the distant inhabited valleys to this sequestered and lonely tarn, a friend of mine agreed to accompany me one fine summer morning, for the purpose of having a day's fishing there. We were both tolerably expert, and although my experience had extended to more lakes and rivers in various parts of the United Kingdom than his had done, yet he had resided some years in the neighbourhood of Coniston Lake, and had a decided advantage over me as regarded a knowledge of char fishing. Besides, he had twice or thrice fished in the very place he proposed conducting me to, and, on one occasion, with almost unheard-of success. However, on our way we made two trifling bets; one referred to who should kill the first char, and the other to who should succeed in killing the largest number. Among other equipments we had taken care to provide a variety of bait, among which be enumerated brandlings (a peculiar kind of worm, mostly found in old dunghills), prepared salmon-roe, maggots, beetles, minnows, artificial flies, &c.; besides our baskets, rods, landing-nets, and an abundance of creature comforts.

I scarcely know of any amusement that is more exciting than angling, for those who are really fond of rural sports; and when a sportsman considers his reputation at stake, the excitement naturally becomes doubly so. My friend and I having reached our destination, after a fatiguing walk of nearly eight miles, and having partaken of some refreshment, we prepared our respective tackle, and commenced fishing. I think it was the second cast of his line that he had a nibble; when, having renewed his bait, at the very next throw he hooked a char, as he supposed, and while he was dragging it struggling towards the stony strand, he commenced hurrahing for victory. The fish being of no great size, he had little difficulty in landing it; but when he had got it fairly ashore, he had the mortification to find it was a trout! Having again renewed his bait, he was scarcely a minute before he hooked, probably a real char, but, unfortunately, in his hurry to commence fishing, he had not properly fastened his bait-line to his reel-line, for at the next moment the loop appeared to give way, and away went the fish with the whole of his line attached to it. There being scarcely a ripple on the dark bosom of the water, we had little difficulty in marking the progress of the fish, as it retreated towards the deeper parts of the lake, by the float occasionally coming bobbing to the surface. This was a serious disappointment to my opponent; for while he was engaged in rigging a new line, I succeeded in taking a couple of beautiful char, weighing nearly half a pound each. Advantages gained at the onset of a contest not unfrequently decide the victory; and so it turned out on the occasion alluded to, for my friend was never able, during the few hours we devoted to fishing, to reduce the distance I had thus early headed him. The success of neither of us was, however, by any means remarkable, he caught but four char and a similar number of trout; while I killed eight char and two or three trout, I forget which. Had I been angling for any other sort of fish, I should have considered this but poor work; but being that far-famed fish *char*, and the place too where they were caught, made some amends for the paucity of numbers. Of the several kinds of bait we tried on that occasion, I found the brandling-worm the favourite, though generally the minnow, spun several feet below the surface of the water, is the most killing bait for char. On one occasion, two acquaintances of mine caught several dozen each (the greatest number I ever remember to have heard of being caught) on the very same ground; a large majority of which were caught by using for a bait the prepared salmon-roe; the day I alluded to above, my friend and I tried precisely the same bait, prepared by the same individual, and not a fish would touch it.

When we had spent several hours in fishing and become somewhat weary with our limited success, the day being clear and fine, we agreed to ascend to the summit of the Old Man, the prospect from thence being as varied as extensive, and in some directions both picturesque and beautiful. Northward is seen a clustering mass of mountains, probably of the most broken and rugged forms of any in the kingdom, for Langdale Pikes are particularly remarkable for their pyramidal shapes and sharp pointed peaks; while the altitude of the loftiest of them a little surpasses that of Coniston Old Man. Eastward, and inclining to the south, lies the vale of Coniston, the chief portion of it being occupied by its lake, which is more than six miles in length, and in some places of a considerable breadth; the village of Coniston near its head, and cottages and farm-houses adorning its banks. Farther eastward a few miles, may be seen through some of the breaks in the ridge that separates the two lakes, glimpses of that Queen of English waters, the winding Windermere; with many a secluded country residence peeping out from the sheltering woodlands, with the ancient little market-town of Hawkshead, and a few small lakes, or tarns, in the intermediate distance. More towards the south, and pretty distant, the view embraces Morecombe Bay; and directly beyond it is seen the ancient borough of Lancaster, with its imposing castle and church crowning a lofty eminence. And farther still the eye wanders over the whole section of Lancashire lying west of the range of mountains which separates it from Yorkshire, even to the river Mersey; and when the atmosphere is remarkably clear, the Welsh mountains may be somewhat indistinctly seen. Towards the south-west, the fertile district of Furness, with its towns, villages, and hamlets, may be traced; while the Irish Sea serves as a background for a considerable part of the picture in a south-westerly direction.

Employment of Buffaloes.—Buffaloes are a good deal employed on this side of Lake Shahee; and here they appear to supersede the use of all other animals for purposes of agriculture. They plough, they drag carts, they carry loads, they give milk, they are killed and eaten; and I must say, that where water is not scarce, they appear to me the most useful domestic animal possible. They are far stronger than bullocks, and not less docile, and they carry full as great a load as a good camel, while their keep is not more expensive than that of the cow, and their milk is nearly if not quite as good. It is true that they cannot do without water, and that, like the water-spaniel, whenever they come to a pool they are apt to lie down in it, to the great detriment of loads and discomfort of drivers or riders. The other day I saw a pair of them coming along, ridden each by a Koord; a pool of black mud lay in their path, and down they both lay, as if by mutual consent, nearly smothering their two gay riders before they could disengage themselves.—*J. B. Fraser's Travels in Koordistan, Mesopotamia, &c.*

Wonders of Creation.—There is no creature in the world wherein we may not see enough to wonder at; for there is no worm of the earth, no spire of grass, no leaf, no twig, wherein we may not see the footsteps of a Deity.—*Bishop Hall's Select Thoughts.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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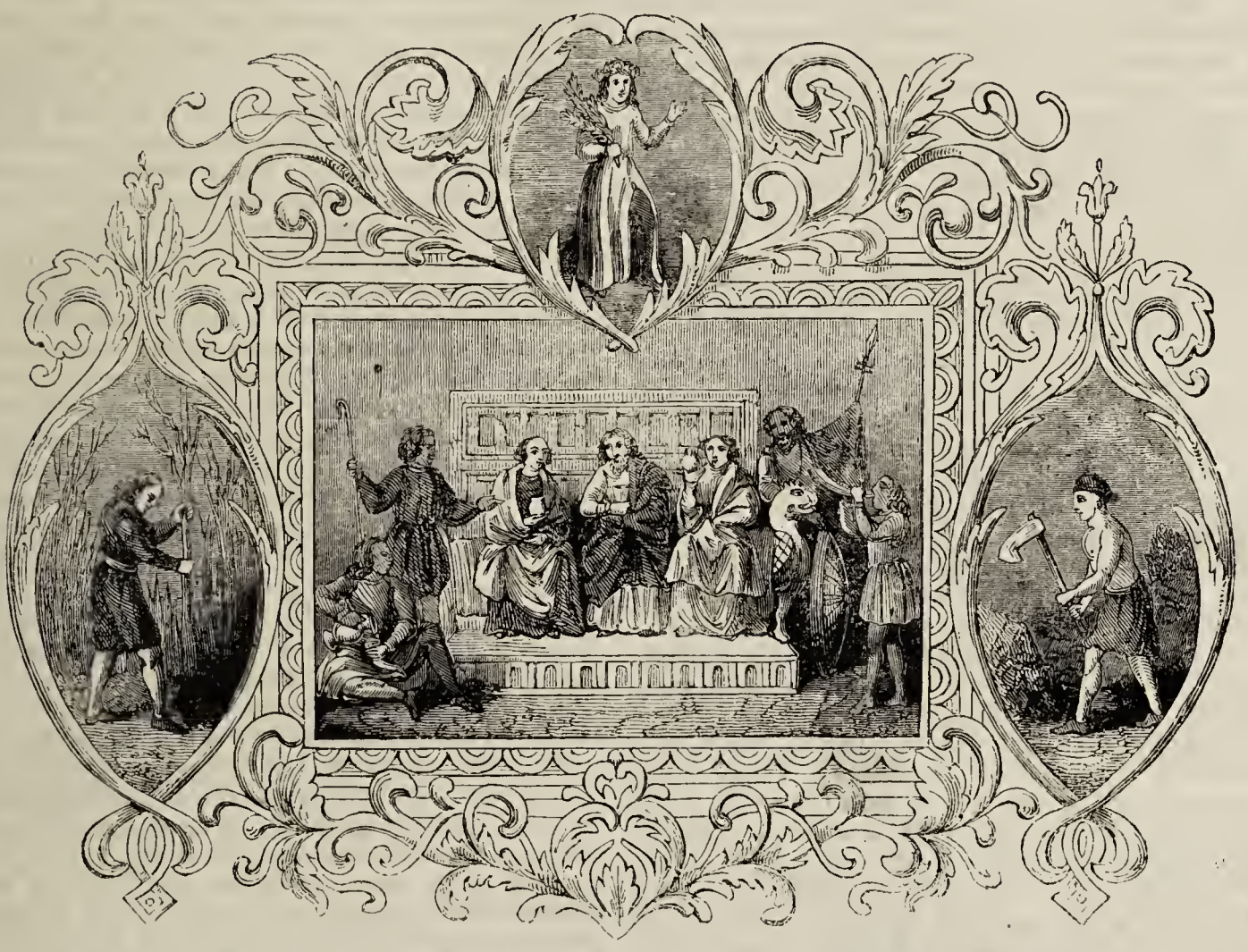
BRITISH AGRICULTURE.

APRIL.



[Saxon Emblems of the Month of April.—Selected from Saxon MSS. in the British Museum.]

Of all the months in the year, that of April is not surpassed, if it be at all equalled, in respect to the deep and exciting interest it imparts to persons connected with and interested in a country life. It is in most cases the renovator of the entire system of vegetation in this and many other countries in the northern hemisphere, being the period in which nature, that has remained bound during the rigidity of winter, again bursts forth into a thousand interesting forms. It is not alone that the varied productions of the soil acknowledge the all-powerful influence of returning spring, that the pastures and meadows appear clothed in cheering green, that the hills and dales become adorned with myriads of flowers so simply beautiful, that, as the sacred volume expresses it, "Solomon in all his glory was not arrayed like one of these;" but the whole animal creation seems to be pervaded by one universal feeling of joy and delight. Hence man would indeed appear unworthy of his superior station and higher destinies were his heart callous to, and his feelings unconscious of, those genial influences that cause the innocent lambs to skip and play, and the speckled lark with joyous song to greet each rising morn.

> "Sweet April showers
> Do spring May flowers."*

* Tusser, 'April's Husbandry.'

We remarked, that this is a season of deep and exciting interest to those engaged in a country life: it is so, because the farmer, having committed his crops to the bosom of the earth, now anxiously watches and beholds the tender blades bursting forth; and according to the indications and appearances thus early given, he already begins to augur, favourably or unfavourably, of the ultimate results of the harvest-field, the stack-yard, and the granary. That he is always able to draw correct conclusions from observations thus early made, is neither supposed nor pretended; for through the succeeding months that his crops have to remain on the ground before they are fit for the sickle, favourable or unfavourable circumstances may intervene which will absolutely determine the fate of the crops, whether for abundance or scarcity, and whether the quality shall be bad or good. But the crops of grain committed to the earth during the past autumn are at this season more particularly the objects of the farmer's anxious observations: winter, the influence of which is always to be more or less dreaded and apprehended, having passed away, he carefully marks appearances and watches the effects produced upon his fields of winter grain by a few days or weeks of bright sunshine, accompanied by congenial April showers:—

> "The work is done, no more to man is given,
> The grateful farmer trusts the rest to Heaven.

Yet oft with anxious heart he looks around,
And marks the first green blade that breaks the ground;
In fancy sees his trembling oats uprun,
His tufted barley yellow with the sun;
Sees clouds propitious shed their timely store,
And all his harvest gathered round his door."*

Nor are the farmer's hopes and fears by any means confined to the crops already in the ground, since a portion of his fields are now undergoing preparations for the reception of late crops, particularly potatoes and turnips. His interests too are affected by the return of spring, for on the duration or continuance of winter commonly depends the period that it is necessary to feed the stock in the farm-yard; and every farmer is aware of the bad effect that a "Winter lingering in the lap of May" has upon both sheep and cattle, at the same time considerably increasing the expenses of maintaining them. But late springs do not invariably bring unprofitable years to the farming community at large; and though the growth of grass should be retarded, it does not follow as a matter of course that a bad effect will naturally be produced on the crops of grain; but this depends upon a variety of circumstances that need not here be explained.

Though late springs add greatly to the expenses of maintaining cattle and sheep—as regards horses, that is, such as are employed upon farms, the difference of the cost of keeping them is not material; for though most working horses may be maintained at a somewhat cheaper rate upon green food, such as clover, lucerne, vetches, or tares, &c. during the summer, than they can be upon dry food—oats, chaff, and cut straw, or even good hay—still the difference is not so very striking. So long ago as the date of Young's 'Tours through various parts of England,' in several districts where agriculture had made the greatest advances under what was then technically styled the new system of husbandry, the culture of clover, lucerne, sainfoin, &c. had been advantageously introduced; yet, even at the present time, there are extensive tracts of country where the cultivation of none of the artificial grasses except clover, and that in a limited degree, is at all known or attempted by the farmers. Young, in his 'Farming Tour through the Eastern Counties,' brings together into one view the results of a mass of experiments on the culture of lucerne, and afterwards adds the following remarks:—"The principal article in this table is the average of the number of horses and the time they are kept, which I have carefully calculated, and find the proportion to be four horses maintained 22¾ weeks on each acre. This is a fact of true importance; and independent of the propriety of weekly charges or general valuations, which are never equally satisfactory. Here we find that on an average of these numerous crops of lucerne, one acre will maintain four horses, soiled in the stable, from the middle of May to the end of October. I need not remark that this product is prodigiously great, and forms an object in modern husbandry of the first magnitude. But that this subject may be as thoroughly understood as possible, I beg leave to observe that here are two circumstances united which ought to be somewhat distinguished, though difficult; it is, the product of the lucerne, and the practice of soiling horses in the stable. Is the vast benefit here apparent all to be attributed to one or the other, or part to one and part to the other, and in what degree?"

Here the writer breaks off without answering those queries, which he acknowledges he cannot satisfactorily answer; but he refers us to another of his Tours, from which we make the following extract, previously noticing that this experiment was made upon a piece of ground containing 1 rood 11 perches:—"Cut twice the first year. The first (cutting) maintained four coach-horses and five calves six weeks; the second kept seven horses a month." The next year the same piece of ground "was cut three times, and maintained seven horses from the middle of May to the end of September." The following year, he says, "it maintained six horses the same time. It saved 12*s*. 10*d*. a week in hay for these six horses; the proportion for the last seven years is therefore 14*s*. 11*d*., and the average 13*s*. 10½*d*. The product, therefore, of (the average of) these two years is this—twenty weeks at 13*s*. 10½*d*. is 13*l*. 17*s*. 6*d*. This per acre is 43*l*. 8*s*. 11*d*. This is a prodigious product, and I think much higher than the culture was ever before carried to." The same writer introduces another experiment upon the cultivation of lucerne, but made in a different part of the country. "An acre," says he, "lasted three horses at soiling the summer through; this, at six months the summer, and at 2*s*. 6*d*. a week per horse, amounts to 9*l*. 15*s*. per acre." In neither of the extracts here introduced, however, are any deductions made for the various expenses attending a crop of lucerne, whereas it annually requires several dressings or weedings before those who cultivate it can reasonably expect good crops. Besides, in soiling horses or cattle in the stable during the summer, no inconsiderable amount of extra labour is incurred beyond that which would otherwise be necessary, since the cutting and carting of the green fodder has to be daily and regularly attended to. Moreover, experiments made upon a limited scale are rarely to be depended upon; and where they are entered into with the express view of making the very most of them, the results should be entertained with considerable caution. There can be no doubt, however, that upon rich and deep soils, and such lucerne requires, this species of grass may be grown advantageously upon farms where soiling is a desirable object; since from its rapid growth after vegetation commences in the spring, as well as after cutting, it generally yields an abundant crop during the summer; besides, both cattle and horses thrive well upon it, and seem to relish it greatly.

But we would not wish to be considered as dictating to the experienced agriculturist when we observe that—though lucerne, sainfoin, and some other artificial grasses answer a good purpose upon soils of particular qualities—clover, generally speaking, is more valuable than any other sort of grass usually cultivated here. One peculiar merit of clover seems to be its adaptation to soils of various kinds and qualities; while many of the other grasses require a peculiar sort of soil to ensure their success. Like lucerne it is well adapted to the summer soiling of cattle or horses; and where it is submitted to the scythe it commonly yields two tolerably good crops of hay, and afterwards good pasturage until the plants are cut down by the frosts, of which it is somewhat susceptible. We will here introduce an experiment or two made upon clover, quoting again from Young's 'Tours:'—"The use of it (clover) in many parts of the kingdom is so great, as to be one of the pillars of good husbandry." Again,—"This grass is so truly serviceable to the farmer, that a clear knowledge of its product and value are [is] the only means of spreading the culture, and of improving it where known." He further adds,—"The importance of a grass that is of so hardy a nature as to bear sowing with corn, and subject to scarcely any failures—that will the very first year yield 3 tons 4 cwt. of hay at two mowings—that will last one, or perhaps two years longer, if it suits the farmer—that is for wheat a better preparation than the finest fallow, requiring at the same time but one ploughing—all these circumstances unite to render clover an object of the highest consequence to these kingdoms, and cannot but amaze one to reflect that there are various parts of them where it is yet unknown." Since Young's 'Tours' were published, clover has been introduced into numerous places where it was then, as he says, unknown; but even now it is not known, or at least not cultivated, in many local districts of our island. Young mentions a

* 'Farmer's Boy.'

farmer who "tried the application of clover in soiling horses, and two acres kept six during nineteen weeks, or three per acre that time, which, at 2*s.* 6*d.*, is 7*l.* 2*s.* 6*d.* Had the horses been pastured in the field," he remarks, "the six horses would have had nine acres." Again, another farmer makes an experiment, the result of which is thus stated :—"Seven acres of clover keeps twenty horses, seven cows, five calves, &c., seventeen weeks; the horses and cows at 2*s.* 6*d.* a week; the amount 9*l.* 2*s.* 1*d.* per acre." And he further remarks, that the same individual found "that five acres soiled, lasted as long as thirty in the field." The average of the above-mentioned sums is 8*l.* 2*s.* 3½*d.* per acre, a return to the farmer, when rents were much lower than they are at present, certainly far beyond the profits yielded by lands in general, even under crops that require much expense in cultivating, while clover requires no expense but that of cutting and carting to the stable; therefore, upon the whole, the result seems exceedingly favourable. But in these instances, as well as those previously referred to in connection with lucerne, it should be borne in mind, that where experiments (and favourable ones, or they would not have been introduced in the way they have been) are introduced, they certainly ought ever to be received with caution. Vetches, or tares, as they are more generally called, have been much cultivated since the period that Young made his various 'Tours;' and their uses in soiling (as well as in early pasturage) have become almost general in many parts of the country. As an early green food for sheep, they are very valuable, and by eating them off, and folding the sheep upon them during this month, many of the farmers upon a single furrow sow late crops of barley, which commonly answer exceedingly well. Soiling answers very well for milch cows where pasturage is scanty, and fat stock is stabled during the summer; but without the aid of oil-cake or meal, the cattle thus stabled seldom attain a sufficient degree of fatness. They are, therefore, commonly pastured abroad during the summer season, where, if they do not consume a larger quantity of food, they at least have a greater choice and variety, since they are at liberty to make their own selection, and on the whole commonly thrive better. There is one advantage in soiling that seems universally admitted, the manure produced in the stable being of considerably more value than when dropped promiscuously over the fields and pastures where the stock is turned out to roam at large. Where the farmer has an abundant supply of straw or bedding for littering his stock that is stabled during the summer, the advantage of this system will be greatly enhanced, for, upon every sort of farm stable manure is always a valuable article.

Respecting the way in which manures in general act upon the soil, or rather upon the crops, even at the present day, there are many conflicting opinions, and the matter still appears but imperfectly understood. Many men, eminent in science, amongst whom the name of Davy stands conspicuous, have applied a chemical knowledge to agricultural affairs, with a view of reducing the husbandman's art to a more regular and certain system. But notwithstanding the enlightened and enlarged views of a number of individuals connected with agricultural interests, the great bulk of operative farmers have been backward in availing themselves of the assistance afforded by science and experiment. Some improvements have, however, become general; and as regards manures, the introduction of bone-dust has effected the most beneficial results in almost every farming district. The dung of various animals, lime, marl, chalk, gypsum, ashes, and a few other substances, or composts formed by mixing one or more of them with clay, peat-earth, loam, or some other substance, constituted nearly the whole catalogue of manures fifty or sixty years ago. And although much less has been effected than we may have hoped for, in our regular Price Currents of the present day we find long lists of manures advertised in the ordinary way, many of which, to the last generation of farmers, were totally unknown. The subjoined list we copy from 'The Mark-Lane Express' of a recent date :—

Manures.	*s*	*d.*	
Bone dust . . .	21	0	per quarter
do. ¼-inch . .	20	0	do.
Rape dust . . .	135	0	per ton
Rags	90	0	do.
Graves . . .	110	0	do.
Gypsum . . .	60	0	do.
Carbon . . .	12	6	per quarter
Soap ashes . . .	10	0	per ton
Artificial manure . .	12	0	per quarter
Patent disinfected .	13	6	do.
Nitrate of soda . .	19	0	per cwt.

Besides these manures there are sundry other substances which may be advantageously applied to particular soils and crops; and it may be observed as somewhat remarkable that soot should be omitted in the regular list of manures connected with our great metropolis, for, as most farmers know, upon many crops it acts quickly, effectively, and beneficially. Salt, in small quantities, may sometimes be used beneficially, while in large quantities its application would prove utterly ruinous. Shell-fish,—and indeed fish of every description,—and in fact, all animal substances, make good manures. But the principal reason why bones and shell-fish are greatly preferred is, in consideration of their fertilising properties continuing to operate much longer than those substances that decay and become quickly decomposed, for pieces of bone, and the shells of mussels, oysters, &c., will remain several years in the soil before they wholly lose their effect, and become what the farmers call dead matter. Whereas many sorts of dung and sundry other manures decay and disappear in a single season; and although their good effects may not entirely cease at the period of their decay, much influence is rarely to be calculated upon afterwards.

It would exceed our limits were we to attempt a practical analysis of the various sorts of substances employed as manures, and give a brief exposition of their peculiar effects upon soils and crops. Upon the subject of manures, the author of the 'Complete Farmer' observes as follows :—"Manures are intended either to repair the decay of exhausted worn-out lands, or to cure the defects of other soils, which are as various in their qualities as the manures used to ameliorate and restore them. Some lands are too cold, moist, and heavy, whilst others are too light and dry. To answer this, some dungs are hot and light, as that of horses, sheep, pigeons, &c.; others, again, are fat and cooling, as that of oxen, cows, hogs, &c.; and as the remedies which are used must be contrary to the distempers they are to cure, so the dung of oxen, cows, and hogs should be applied to lean, dry, light earths, to make them fatter and closer, and hot and dry dungs to cold, moist, and heavy lands."

When the early part of the spring—as has been the case in the present season—is favourable for getting the seed into the ground, the farmer can then direct his attention to the preparation of his turnip lands and the ploughing up of his fallows. Attention to fallows is an irksome task to the farmer, for when a field requires ploughing in the autumn, again in this month or the beginning of next, and once or twice at least during the summer, it is a distant period to look forward to,—that of the second autumn,—as the earliest period at which he can possibly reap the slightest profit. Rents ought certainly to be moderate where the occupier has to wait two years before he reaps one crop, during which, or at least for the first year, the poor and greedy soil requires a considerable outlay of labour, and consequently of expense,

since, in addition to the necessary ploughings, there is the additional cost of manuring.

> "If April be dripping, then do I not hate
> (For him that hath little) his fallowing late;
> Else otherwise, fallowing timely is best,
> For saving of cattle, of plough, and the rest."*

But as regards fallowing, there probably is not any part of arable farming in which a greater change has taken place since the days of Tusser; for through the introduction of green crops, a better system of tillage, and superior manures, fallowing upon soils where green crops can be raised is nearly exploded. However, upon poor clayey soils, it is still necessarily resorted to, for not only by a summer fallow are the weeds eradicated, but the soil, by frequent stirrings, is loosened and ameliorated. Formerly, fallowing once in two or three years was looked upon as a matter of course, and even now we find that the custom is not wholly exploded from many parts of the country, where a different management would certainly add greatly to the farmer's profits. Young, in his 'Farming Tours' through the kingdom, very justly remarks to the following effect,—that in most places where the very worst management continued to exist among the farmers, nothing but raising their rents would produce the desired results. In many cases this advice was adopted by the landlords, and the consequences generally were just what Young had predicted; for such of the tenants as had not been able to provide for the rent-day when rents were low, after the rents were raised very considerably found themselves under the absolute necessity of departing from their old and unprofitable system of conducting their affairs, and had to attempt many things that they had hitherto considered an innovation upon old customs. In a great majority of cases, instead of farmers being ruined by an increase of rent, their dormant energies were called into action, and a contrary effect was the consequence, save amongst the slothful and obstinate.

Since we consider fallowing certain kinds of soil still an object of some consideration among agriculturists, we will introduce the opinions of two or three writers on husbandry, at a period when the *new* husbandry was not so generally practised. The author of the 'Complete Farmer' observes, "If the farmer finds that one summer's fallow does not entirely answer the purpose of loosening and dividing the earth, it is his interest to continue it with another. Tull," he remarks, "confirms this, by instancing a poor man, whom necessity compelled to take this method, because he could not get seed for his ground after he had tilled it the first year. The consequence was, that his crop was worth more than the value of the land it grew upon." "Mr. Maxwell," he adds, "mentions another, who, from a like necessity, following the same course upon almost his whole farm, had such a crop as enabled him to pay many debts, and, by continuing the same practice, came in a few years to be in a condition to purchase the farm."

After the first and second ploughings, that is, after the ground has been broken up in the autumn and ploughed again in the spring, it would be useless to suggest the number of ploughings that should be given to fallow lands afterwards, or the precise dates at which they ought to take place; because these things will depend upon the nature of the soil, the character of the summer weather, and the kind of weeds that have to be eradicated. For as most summer fallows are intended for wheat (rye being now comparatively little cultivated), persons conversant with farming affairs will know that some kinds of soil may be reduced to too fine a state of pulverization by frequent ploughings, as well as suffered to remain too little subdued and broken.

It is during the latter part of the present month, or the beginning of May, that farmers and horticulturists who make the cultivation of the potato a feature in their labours, usually commence potato-planting, provided the weather has been favourable for getting the ground ready; for, like most other general crops, a week or two later or earlier ought to be less of a consideration with those who plant them, than a fit condition of the soil. In making this remark, an exception may exist where the old mode is still adopted, the custom generally prevailing in Ireland, which is commonly called "lazy-bed" planting.

The potato was first introduced into this country, from Virginia in America, about 200 years ago. National tastes are seldom acquired very rapidly, and for a long period after their introduction they were but in low repute, not being admitted at all to the tables of the wealthy, nor even much relished by the poorer classes, who, however, found it convenient to make use of them, particularly when corn happened to be scarce and dear. They have, however, by little and little, effected a thorough revolution in the national taste, for they are now as commonly found at the table of the peer as at that of the cottager. They early gained a footing in Ireland; and so materially does the sustenance of the Irish peasantry depend upon this vegetable at the present day, that a more dire calamity could hardly befal them than a failure in the potato-crop.

Mention has already been made of the lazy-bed fashion of cultivating the potato, a short explanation of which we now give. A piece of ground having been selected for this purpose (where the parties possess sufficient land to admit of making a choice), the green sward is commonly pared off. The bed, or space to be planted upon, is then spread with stable or other manure, upon which the potato-sets (small potatoes, or larger ones cut into pieces) are placed, at six, eight, or ten inches asunder; and then they are first covered with the sods that had been pared off the surface, the grassy side downwards. After this trenches are dug on each side the bed, which usually is from four to six feet wide, and the soil, and often a portion of the subsoil, is dug up (no easy task in hard ground), and equally distributed over the bed to the depth of three or four inches. In one respect the soil, or even the subsoil, which is procured at a considerable depth below the roots of the grass, answers a very good purpose; for it yields no weeds itself, and serves to prevent the grass springing up from the edges of the sods, or the weeds that may have been deposited in the manure. When the trenches on each side of the bed have been cleared of the soil, which should be spread evenly over the bed, the work is considered finished; and nothing afterwards is done to the crop, neither hoeing nor weeding being considered necessary. Potatoes grow best, and are of the best quality, where the soil is light and dry; but they may be planted, lazy-bed fashion, upon moist or even wet soils, since the deep trenches drain the narrow beds thoroughly. Three-pronged forks with flat tines are generally used in digging up the crops of potatoes planted in this way, and although the produce is seldom very large, 200 bushels on the acre is no extraordinary crop.

But the most general mode of planting potatoes, where they are grown in large quantities, is in rows or drills, the plough being employed in preparing the ground, opening the furrows for the reception of the manure and potato-sets, in covering them up when planted, in hoeing and earthing them up into ridges, and finally in ploughing up the crop at the season of gathering them in. The rows or ridges are commonly from two and a half to three feet apart, and in some instances the potato-sets or plants are deposited beneath the manure, but more generally upon it. However, upon this point considerable diversity of opinion still exists, and controversies are frequently entered into respecting it. When the manure and the sets of potatoes have been placed in the furrows

* Tusser, 'April's Husbandry.

formed by the plough (a double mould-board one being often employed), the plough then divides the ridges, turning the soil both ways, and thus covers up the plants or sets. During the summer they are kept clear of weeds by horse or hand hoeing; and when the stalks become pretty well grown, the earth is well ridged up against them, by which means the crop is commonly much increased. In the season of gathering them, the plough passes along the ridges, rooting up the crop as it moves along, the requisite number of gatherers following after with baskets. When all have been collected that were visible to the persons employed as gatherers, the ground is harrowed, a few stragglers are obtained, and thus ends the potato-harvest.

In the west of England, as well as in the vicinity of many of our larger towns and cities, the farmers and market-gardeners plant their potatoes in very narrow rows, and ridge them up with hoes, cultivating them wholly by hand labour, and often produce very large crops. Sometimes we see them planted in what are called hills, the operation being performed thus:—Shallow holes, three or four feet apart, are dug with hoes (the ground having been ploughed and harrowed), in each of which four or five sets are placed, with or without manure, when a moderate covering of earth is drawn over them by the same implement. When they have shot up a few inches above the surface they are hand-hoed, and when the stalks are about a foot high the earth is hoed up towards them, and a second time during the summer, by which means hills are formed, and hence the name of this method of planting. A good deal of labour is required, but to commence the operation does not require the soil being in fine tilth, or quite clear of weeds, for the frequent hand-hoeing keeps everything under subjection. This mode of planting is generally adopted in North America.

With regard to the best way of growing this valuable vegetable there are still various opinions. Some persons recommend planting large potatoes whole; others prefer planting only the smaller ones, such as are not marketable, and therefore of less value. The general (and best method) is to cut the larger ones into three, four, or five sets or parts each, taking care that each set contains one or more eyes or buds. Others again make use of a small implement invented for the express purpose of scooping out the eye or bud with a little of the potato attached to it, which eyes or buds are planted instead of the whole or quartered potatoes; by which means the principal part of the potato is saved to be applied to domestic or other purposes. From the time the young plants first appear above ground, until a natural decay takes place as the roots advance towards maturity, the potato-stems are at all times very susceptible of frost; hence it seldom answers to plant them on an extensive scale so early in spring as to endanger their being cut off or seriously injured by late frosts; neither does very late planting succeed, for late-planted potatoes are of an inferior quality, and are liable to be injured by early autumnal frosts.

Though a light sandy loam is the most favourable soil for the growing of potatoes of a good quality, there is scarcely a cottage in the kingdom, with a garden or small plot of ground attached to it, no matter of what kind or quality the soil may be, where we do not find this vegetable cultivated. Even in the bogs of Ireland, they are commonly planted; and there is not a district of country anywhere, even where the soil is a tenacious clay, that we do not find the culture of potatoes more or less attended to by the farmers.

The different varieties of this vegetable are exceedingly numerous, and varying very materially, not only in colour and shape, but likewise in quality and flavour. Some are of so early a sort that they arrive at maturity in one half the time that others do; others are of good quality, but not productive, and therefore only used at table; whereas other sorts yield an abundant product, but are so inferior in quality that they are given to hogs and farm stock. The potato does not generally ripen its seed in our climate; though a few sorts, in favourable seasons, bring their apples to maturity. By preserving and planting the seed, new varieties are produced; but as in the case of planting the seeds of apples or pears, so it is with potatoes, for out of a great number of new varieties, very few are produced worth cultivating.

The cultivation of timber may not appear to come immediately under what is familiarly understood by the term farming; and yet the growing of timber, of sundry sorts and sizes, is as necessary for the well-being of the community as the cultivation of the potato, or even of corn, which is accounted the staff of life. Tenant farmers, however, except in particular districts, where the country is rough and broken, and consequently unfit for tillage, seldom have much to do with planting, or with the management of woods and plantations; the landlords generally, where they are extensive, retaining them in their own hands, and placing them under the superintendence of persons appointed to that especial object, under the name of wood-bailiff, wood-reeve, or some other local appellative. Coppice-woods are sometimes rented by tenants that enjoy pretty long leases, the coppices usually occupying the roughest parts of the farm. In most cases it would be unwise and unprofitable to convert lands which could be grazed or cultivated into woods and plantations; but experience has proved, in many cases, that not only soils of an inferior quality, but even such as are calculated for grain and grass, may be profitably converted into plantations of various kinds of timber. The chief reason why we grow so little timber, and consequently have so much to import from foreign countries, is the period that necessarily must elapse after planting before any income can be derived. In speaking of cutting down coppice-woods for hop-poles, &c., Tusser says:—

> "First see it well fenced, ere hewers begin,
> Then see it well stadled without and within;
> Thus being preserved, and husbandly done,
> Shall soon raise profit to thee and thy son.
> Leave growing for stadles the likest and best,
> Though seller and buyer dispatched the rest.
> In bushes, in hedge-row, in grove, and in wood,
> This lesson observed, is needful and good."

In reference to the subjoined quotation, Dr. Mavor has the following remark:—"There are several obvious advantages attending the fencing of woodlands before felling. 'To stadle woods,' is to leave a sufficient number of thriving young trees, in order to replenish it (them?); and a superabundance is to be recommended, which may be thinned as they increase in size." In another place the same writer observes:—"The cutters of underwood are still to be cautioned against waste; and where it is sold standing, due reserves ought to be made of young timber at suitable distances; which may again be thinned at each subsequent fall, and fresh supplies left to supply their places. With proper management, coppices may be rendered of double their usual value. A good system has lately been adopted in the Duke of Marlborough's woods in Oxfordshire, of leaving a large number of promising stocks for the purpose just mentioned, which not only increases the beauty of the woodland scene, but proves a nursery for future timber. This circumstance would not have been so particularly mentioned, had not the prevailing practice in regard to woodlands been erroneous. A nobleman or gentleman who has extensive underwoods should employ his own people to cut, and then to sell."

In many parts of England and Scotland too, the owners of extensive tracts of waste lands, many of them commons recently enclosed, and particularly where such lands are hilly, and the soil scanty or of a poor quality, about the beginning of the present century turned their attention to

the improving of those wastes by planting them with various kinds of timber-trees, though the larch and Scotch firs were generally adopted. After some of these commons had been fenced into large allotments, the lands would not have rented for more than one, two, and three shillings an acre per annum, for they yielded so scanty and poor an herbage as barely to afford a few small hardy cattle or mountain sheep a precarious sustenance during the summer months; while during the greater portion of the year they were of real value. But supposing such lands had been rented for half-a-crown per acre during the last forty years, the amount of yearly rents, without calculating any interest, would be but 5*l.* sterling per acre. Were we to compare this sum with the value of the timber now growing upon most of those lands that have been planted, the advantage in favour of planting would be very great indeed; since most kinds of trees, but particularly the larch, spruce, and Scotch fir, have thriven much better than the most sanguine had either hoped or expected. Some expense was necessarily incurred at the time of planting, and occasionally for a few years afterwards in bestowing a little care and attention upon the young plantations; but by the time they were 15 or 20 years old, they began to yield some profit by the sale of the cuttings and thinnings that became neccssary; and this has continued the case up to the present period. Many writers have tried to convince the owners of estates, or occupiers in the possession of long and unrestricted leases, of the immense advantages to be derived from planting their lands, or certain portions of them, with forest trees the best adapted to the soil and situation; but with what little success must be obvious to those who have taken the trouble to enter upon and investigate the subject. A few extracts from Young's 'Tours through most of the Counties in England' may throw some light upon this subject, and assist in bearing out the opinion already expressed in favour of planting. It may be as well to remark, before making these quotations, that at the time when Young published the results of his observations upon the general agriculture of the country, that both rents and the prices of all sorts of timber were much lower than they are at present, both having advanced in a nearly similar proportion.

The following experiments were made on the estate of Wm. Mitford, Esq., of Gilbury, on the confines of the New Forest:—"Cedars of Lebanon, silver firs, spruce firs, pinasters,—of 40 years' growth; average value 15*s.* 5*d.* each tree; number of trees on the acre 1210; total value 932*l.* 14*s.* Deduct for 40 years' rent and sundry expenses 28*l.* 10*s.*,—leaving a balance of 904*l.* 4*s.*; or at the rate of 22*l.* 11*s.* per acre, per annum." The writer then remarks—"The profit is surprisingly great, and excceding anything that husbandry can produce. To reap above 20*l.* per acre, from the first day of planting—exclusive of thinnings, is a profit that proves how fine a resource landlords have for raising large sums of money, who can wait such a period for the return. But had these trees been cut at 20, 25, or 30 years, there can be no doubt but the profit would have been very great, though not so high as (at) 40 years. The value of the fee-simple of the land, soon after planting, bears no proportion to that of the timber on it. Is not this, therefore, a ready way to double, treble, or quadruple estates?"

"In another plantation, the growth of which is 17 years, and the trees are 7 feet square (apart)—average 1*s.* 3*d.*,—and there being 888 trees on the acre, the value of the whole is 55*l.* 10*s.* Various expenses, and rent for 17 years to be deducted, 9*l.* 12*s.*; profit 45*l.* 18*s.*,—or 2*l.* 14*s.* per annum, per acre. Here we see an instance of making 2*l.* 14*s.* per acre, per annum, from the first planting of poor land, at 6*s.* an acre: and I should remark that this plantation is on a hill and exposed to the south-west, which wind here blows with a fury that none can exceed, as all the trees in the country bear ample testimony, by turning their blasted heads from it. No husbandry will with so little, or rather with no trouble, hazard, or expense, equal this profit on such poor land. And it is made in the term of 17 years; which admits of so many men to plant, and expect themselves to reap the profit."

Many more experiments upon planting appear to have been made by the same gentleman, which the author of the 'Farmer's Tour' introduces into his work; but instead of entering into any particulars, for the sake of brevity we will only transcribe their profits generally, concluding with a few remarks that the subject seems imperatively to call for:—

		£	*s.*		
Growth	40 years	22	11	per Acre,	per Annum.
„	45	11	10	„	„
„	17	2	14	„	„
„	30	19	18	„	„
„	34	6	11	„	„
„	29	8	7	„	„
„	30	9	16	„	„
„	19	16	10	„	„
„	48	16	10	„	„

Averages taken from the above:—

		£	*s.*	*d.*		
From	34 to 45 years growth	13	10	8	per Acre,	per An.
„	29 to 30 „	11	4	0	„	„
„	17 to 19 „	9	16	0	„	„

It is by no means our intention to attach discredit to the statements and calculations introduced by Young in his various 'Tours,' many of which are evidently not his own; but we think it must be admitted, that he, like many other writers upon agriculture, has occasionally allowed his feelings to lead his judgment into error: for when treating of matters and subjects that he would wish to recommend to his readers, entertaining a consciousness of their merits and general utility, the calculations introduced, although by no means intended to deceive, will not in all cases bear a strict scrutiny. Indeed, experimental farming is seldom conducted fairly and honestly, particularly where the experiments are upon a limited scale,—for either a greater amount of labour and attention is devoted to them, than what is bestowed upon crops in the ordinary way,—or the soil selected is of a superior quality, and better suited to the purpose to which it is devoted, or else situation or some other direct or indirect circumstance is in their favour; since few persons enter upon a series of experiments free from a previous bias, but entertain a desire to prove or disprove the theories and opinions that have already been published or expressed.

Admitting the gentleman's experiments upon planting already quoted to be honestly detailed, it does not appear that any difference is taken into the calculation in consideration of receiving a yearly income or receiving nothing whatever until the expiration of thirty or forty years. We find 3*l.* allowed at the very commencement as the expenses per acre for plants, planting, &c., and this sum is carried to the general account at the expiration of 45 years, without one penny of interest; whereas the proper way to have treated the subject would have been to have allowed compound interest upon this sum and all other monies that would have been received during any intervening period. Now as money invested at compound interest at 5 per cent. per annum doubles the principal in something more than 14 years—at the end of 45 years, calculating the interest as above, instead of a nominal 3*l.*, we should have $3 + 3 = 6$ at the end of 14 or 15 years; then $6 + 6 = 12$ at the end of 28 or 30 years; and $12 + 12 = 24$ at the end of about 43 or 44 years: instead of 3*l.* as entered in the calculation quoted. In addition to this there would also be a considerable increase on the amount of rents, calculating interest in the same way,

and instead of allowing 13*l.* 10*s.* for 45 years' rents at 6*s.* per acre, per annum, the rents would amount to almost 60*l.* This undoubtedly is a great difference from the sums we find in the account quoted; and yet, after all, the profits upon most of the experiments would still be very considerable, though much less than they are made to appear; so that there can be little doubt of the general success of judicious planting where persons possess the means of waiting until the plantations arrive at a profitable state.

There is one branch of stock-farming, and a very interesting and important one too, that we have not yet alluded to in our Supplemental articles,—we refer to the breeding and raising of horses. It may be true that this is not considered so distinct and regular a branch of farming as some others; and hence in treatises connected with our subject, it is not so commonly spoken of, but reserved for other publications; but there can be no doubt of the importance of the subject, when we consider the value of the horse, and that it is estimated the United Kingdom contains above one million and a half. It can hardly therefore be objected to our devoting a limited space to this branch of farming, particularly since this is the season of the year when many brood mares produce their foals.

Long before much competition existed, or much emulation was excited, in the improvement of the breeds of cattle and sheep, at least to any considerable extent, the reverse was the case as regarded horses. Not, however, among the great body of persons of which the husbandry classes were composed; but by such as could afford to support equipages and equestrian pomp and parade. As the taste increased for those national recreations and amusements, the race-course and the chase, neither pains nor expense were spared in improving the breeds of horses best adapted for those purposes. Numerous importations from countries the most noted for their breeds of horses, namely, Arabia, Spain, and the Barbary states, took place to promote the desired object; and so persevering and successful have been the efforts of those who felt deeply interested in the matter, that at the present period there seems little doubt that England possesses a more valuable breed of horses than any other country in Christendom. It might be a difficult matter to arrive at the actual value of our first-rate thorough-bred horses, since so much depends upon circumstances of a contingent nature; but it may be stated as neither very rare nor uncommon occurrences, that blood-horses have been sold for 3000, 4000, or 5000 guineas each. Such prices, however, are commanded by those only that can boast of eminent pedigrees, and that have proved their superior qualities on the race-course; since the best hunters, and saddle and carriage horses, although frequently of considerable value, never command prices approaching to those above stated. It is a somewhat curious fact,—that although we have found it impossible to improve the blood of the finest imported Arab horses,—by assiduous care, and superior management, our stud-breeders have contrived to increase the size and power, without injuring the shape and symmetry, an object that has been considered of the highest importance.

While thorough-bred horses, and crosses therewith, have continued to attract the attention of noblemen and gentlemen connected with the turf or with hunting, the agricultural interest has not been unmindful of the improvement of the various breeds and crosses that are found in different parts of the empire; and yet, in a majority of cases, the results have not been so favourable as many were led to expect; for if we compare the general improvement that has been effected in country stock horses, during the last half or three-quarters of a century, with what has taken place in other farm stock, both sheep and cattle, it will be found that the value of the horse has not advanced in anything approaching a corresponding degree.

It is not our intention to enter into the national or general history of this noble animal, nor to attempt to enumerate and classify the various breeds and crosses existing at present throughout the country, which are continually changing and intermixing with each other; it shall, therefore, only be observed, that we have some with coats almost as long and shaggy as the Greenland bear, while others are as sleek and smooth as the dormouse. Again, we find them varying greatly in size, from the small Shetland pony, which is scarcely larger than a good-sized ram, to the huge fen or dray horse, which is sometimes almost as large and powerful as a moderate-sized elephant.

Among our Saxon ancestors, and even at a much more recent period, oxen were solely used for agricultural purposes. We learn from Cæsar's 'Commentaries,' as well as from other writers of the same period, that when the Romans made themselves masters of Britain, the native inhabitants possessed great numbers of cattle, but comparatively neglected the plough, their food principally consisting of the flesh and milk of those animals. About the fifteenth and sixteenth centuries, horses began to be partially employed in the plough and the wain; but it was not until the latter part of the seventeenth and the beginning of the eighteenth centuries, that they became generally used in the plough in any part of the kingdom. Since the date of the latest period, horses have by no means wholly superseded oxen in many of the arable farm districts. The unimproved condition of the roads, no doubt, prolonged the use of oxen in the wain and the waggon; for we find that about the time when roads became generally improved, the introduction of lighter wheel-carriages took place, and along with them an increased use of horses. Even at the present day, much diversity of opinion exists upon the subject of employing oxen or horses in agriculture. It may be advanced in favour of employing oxen (without at all entering upon the general question), that they may be worked a few years and then fattened and sold to the butcher, without the original value of the animal being materially, if at all, reduced; whereas the farm-horse soon begins to lessen in value, and this deterioration continues from year to year, until he is worn out and becomes worth only the price of his hide and shoes.

Though the original breeds of cattle in this country have become so mixed and intermingled in every possible way, that it would be useless to attempt to define with any degree of certainty the stock from whence the cattle at present occupying any local district originally sprang; yet many writers limit the present prevailing distinctions to long-horns, short-horns, and middle-horns. But we frequently find cattle spoken of under distinct appellatives; such, for instance, are the Devonshire, Alderney, Hereford, Sussex, Lancashire, Teeswater, Ayrshire, Holderness, Galloway, Highland, and other breeds. Our present purpose is only to offer a few remarks on the uses of oxen in agriculture, and what breeds are the best adapted for being employed in this way.

The Devonshire oxen have long been considered as unrivalled in the yoke, since they possess some of those qualities most desirable in working cattle; among which may be mentioned great quickness of action, docility and goodness of temper, stoutness, and a truth and honesty of purpose when at work that many horse-teams cannot pretend to. "The principal objection to the Devonshire oxen is," says a modern writer,* "that they have not sufficient strength for tenacious clayey soils; they will, however, exert their strength to the utmost, and stand many a dead pull, which few horses could be induced or forced to attempt. They are uniformly worked in yokes, and not in collars. Four oxen, or six young steers, are the usual team employed in the plough." Vancouvre, in his 'Survey of Devonshire,' says "that it is a common

* W. Youatt.

day's work on fallow land for four steers to plough two acres with a double-furrow plough."

The writer previously quoted,* in speaking of the Sussex oxen, says, "About the South Downs oxen are much employed, but not perhaps in an equal degree to horses. In the Weald of Sussex they have the greater share of the labour; and on a farm of 100 acres there is usually a horse and an ox team; on a larger farm there are more oxen." Again: "The coarser breed is always slow, and soon after six years old it can scarcely be worked at all with advantage. The lighter breed, the true Sussex of many a century, will step out as light and as fast, and will do almost as much work as any horse, and stand as many or more dead pulls." In speaking of their uncommon speed, he remarks, "Of the speed which some of them possess, proof was given when a Sussex ox ran four miles against time over the Lewes race-course, and accomplished the distance in sixteen minutes."

Since there appear to be no other sections of the country where oxen are more employed in agriculture than in the counties already alluded to, a reasonable inference may thence be drawn that there are no other breeds of cattle superior, if equal, for husbandry purposes, to the Devon and Sussex breeds. Our limits will not allow us to enter further upon this interesting subject, and we conclude with a quotation from the same author to whom we are indebted already for a few extracts; it refers to the Devonshire ox employed in the plough:—

"There is a peculiarity in driving the ox team which is very pleasing to the stranger, and the remembrance of which, connected with his early days, the native does not soon lose. A man and a boy attend each team; the boy chants that which can scarcely be regarded as any distinct tune, but which is a very pleasing succession of sounds, resembling the counter-tenor in the service of the cathedral. He sings away with unwearied lungs, as he trudges along, almost from morning to night, while every now and then the ploughman, as he directs the movement of the team, puts in his lower notes, but in perfect concord. When the traveller stops in one of the Devonshire valleys, and hears the simple music from the drivers of the ploughs on the slope of the hill on either side, he experiences a pleasure which the operation of husbandry could scarcely be supposed to be capable of affording. This chanting is said to animate the oxen somewhat in the same way as the musical bells that are so prevalent in the same county. Certainly the oxen move along with an agility that would be scarcely expected from cattle; and the team may be watched a long while without one harsh word being heard or the goad of the whip applied. The opponents of ox-husbandry should visit the valleys of North or South Devon, to see what this animal is capable of performing, and how he performs it."

* W. Youatt.

MONTHLY CALENDAR.—MAY—Fifth Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock aft. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h. m.		h. m.	h. m.
1 F	122	*St. Philip and St. James.*	4 34	3 5	7 21	28·9	3m50	7a16
2 S	123	. . .	4 32	3 12	7 23	●	4 11	8 51
3 *Su*	124	2 *Sunday after Easter.*	4 30	3 19	7 24	1·5	4 41	10 22
4 M	125	. . .	4 28	3 25	7 26	2·5	5 26	11 37
5 Tu	126	. . .	4 26	3 30	7 28	3 5	6 28	morn.
6 W	127	. . .	4 25	3 35	7 29	4·5	7 47	0 32
7 Th	128	. . .	4 23	3 39	7 31	5·5	9 14	1 8
8 F	129	Half Quarter.	4 21	3 43	7 32	☽	10 38	1 33
9 S	130	. . .	4 20	3 47	7 34	7·5	11 59	1 51
10 *Su*	131	3 *Sunday after Easter.*	4 18	3 49	7 35	8·5	1a17	2 5
11 M	132	. . .	4 16	3 51	7 37	9·5	2 31	2 16
12 Tu	133	Easter term ends.	4 15	3 53	7 39	10·5	4 44	2 27
13 W	134	Old May Day.	4 13	3 54	7 40	11·5	4 57	2 38
14 Th	135	. . .	4 12	3 55	7 42	12 5	6 10	2 50
15 F	136	. . .	4 10	3 54	7 43	13·5	7 23	3 5
16 S	137	. . .	4 9	3 54	7 45	○	8 36	3 24
17 *Su*	138	4 *Sunday after Easter.*	4 7	3 53	7 46	15·5	9 43	3 50
18 M	139	. . .	4 6	3 51	7 47	16·5	10 41	4 26
19 Tu	140	. . .	4 4	3 48	7 49	17·5	11 27	5 13
20 W	141	. . .	4 3	3 46	7 50	18·5	morn.	6 13
21 Th	142	. . .	4 2	3 42	7 52	19·5	0 1	7 23
22 F	143	*Prss. Eliz. born* 1770.	4 1	3 38	7 53	20·5	0 26	8 37
23 S	144	. . .	3 59	3 34	7 54	21·5	0 45	9 54
24 *Su*	145	5 *Sun aft. East. Rogation*	3 58	3 28	7 56	☾	1 0	11 11
25 M	146	[*Sun. Q. Vict. b.* 1819	3 57	3 23	7 57	23·5	1 13	0a29
26 Tu	147	Trinity Term begins.	3 56	3 17	7 58	24·5	1 25	1 48
27 W	148	. . .	3 55	3 10	7 59	25 5	1 38	3 12
28 Th	149	*Ascen. Day. Holy Thurs.*	3 54	3 3	8 1	26·5	1 52	4 41
29 F	150	King Chas. II. restored.	3 53	2 55	8 2	27·5	2 11	6 14
30 S	151	. . .	3 52	2 47	8 3	28·5	2 35	7 47
31 *Su*	152	*Sunday after Ascen. Day.*	3 51	2 39	8 4	●	3 13	9 12

Barometer. Ins.

Mean height	29·893
Highest	30·380
Lowest	29·160

Hygrometer. °

Mean dew-point	46
Highest	62
Lowest	28
Mean dryness	7·9
Mean greatest do. of day	15·6
Greatest dryness	24

Thermometer.

Mean temperature	54
Highest	70
Lowest	33

Radiation.

Mean great. of Sun	30·5
Greatest power	57
Mean cold of terrest.	4·2
Greatest ditto	13

Ins.

Mean qty. of rain	1·853
Mean of evap.	3·286

Table of the Winds.

	Days.	Dew-P.
N.	3	42°
N.E.	4	40 ·5
E.	4½	45 ·5
S.E.	4	50 ·5
S.	1	54
S.W.	6¼	49 ·5
W.	5¼	46 ·5
N.W.	3	41

SUNDAY LESSONS.

May					
		MORNING.			
3	2 aftr	East.	Nb. 23, 24..	Mtt.	1
10	3	„	Deut. 4..	„	8
17	4	„	„ 6..	„	15
24	5	„	„ 8..	„	22
31	Sun. af. As.	„	12..	Mrk.	1
		EVENING.			
May 3		Numb. 25.....		Romans	8
„ 10		Deuter. 5.....		„	9
„ 17		„ 7.....		„	10
„ 24		„ 9.....		1 Cor.	7
„ 31		„ 13.....		„	14

THE MOON'S CHANGES.

New . . . 2d day, 0h. 6m. mn.
First Quart. 8th day, 2h. 50m. aft.
Full . . . 16th day, 11h. 30m. mn.
Last Quart. 24th day, 1h. 24m. aft.
New . . . 31st day 7h. 15m. mn.

Day of Mth.	Length of Day.	Day's increase	Day break.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	
1	14 47	7 2	1 45	9 54	15′ 53″
6	15 4	7 19	1 25	10 31	15 52
11	15 21	7 36	1 1	10 56	15 51
16	15 36	7 51	0 28	11 36	15 50
21	15 50	8 5	No real Night.		15 49
26	16 2	8 17			15 48

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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THE NEWCASTLE IMPROVEMENTS.—No. V.

[Grey Street from Dean Street, Newcastle-upon-Tyne.]

The east side of Grey Street is composed, like the west, of sections, each of which exhibits a different design. The range of shops extending from Mosley Street to Shakspere Street has for its centre-piece a colonnade of lofty Corinthian columns, while the wings and projections are adorned with pilasters surmounted by balustrades.

The range from Shakspere Street to Market Street has the Theatre for its centre. By a good arrangement, the front of the Theatre is the only part visible from any street, the rest of the building running back between ranges of houses, so that the architect has avoided the blemish of a long extent of dead walls, while not a foot of the frontage on the neighbouring streets is wasted. There is a house and shop on each side the front of the Theatre, and ranges of shops enclose its sides. The ground being more valuable in Market Street than in Shakspere Street, it was Mr. Grainger's desire to erect more spacious shops and dwellings on the north side of the Theatre than on the south, and it became necessary to push the body of the Theatre out of the centre of the ground. This is done, and so ingeniously, that no visitor, architect or other, has ever discovered what might have been a serious blemish. The front, it is needless to say, is in the centre of the street design. After ascending the steps, the visitor enters the rotunda on one side, thus turning a little to the south to reach the great body of the building. The design of this Theatre was furnished by Mr. Benjamin Green of Newcastle, and is highly honourable to him. It is considered equal to any theatre in the kingdom in point of safety, convenience, and beauty; and is surpassed, as to extent, we believe, by few or none but Covent Garden and Drury Lane. The form of its interior is nearly the same as that of Drury Lane, the bulk of the audience being provided for, as in that theatre, in the centre of the house, by the flattening of the horse-shoe figure. The conveyance of sound is admirable. The corridors surrounding the boxes and pit are all fire-proof, being built of stone. The gallery staircase is constructed with such turns, guarded by strong partitions, as may best obviate danger from pressure, in case of an alarm of fire; and an additional flight of stairs is provided to be opened in case of accident. The building measures 170 feet backwards, and 57 feet in width.

There are other advantages, besides beauty of appearance, from this building being enclosed by others. It has greater stability than if its whole weight, and that of its contents, rested upon unsupported walls. There is both safety and convenience in the entrances being all from different streets. The entrance to the boxes is, of course, from Grey Street, through the portico and rotunda, the second tier being reached by a staircase from the rotunda. The entrance to the pit is by a wide passage from an archway in Market Street; and the gallery is reached from a similar archway in Shakspere Street. The quiet and order of the Theatre (it may be mentioned) are greatly promoted, and crowding prevented, by a floor 15 feet wide, and extending across the Theatre, being left open behind the gallery seats.

The Grey Street frontage, including in its design the house on each side, is 120 feet in length. The façade is divided into three masses; the centre one comprising a grand portico (after that of the Pantheon at Rome), of

six Corinthian columns, upon pedestals about six feet high, and surmounted by an enriched pediment, the tympanum of which is ornamented with the Royal Arms cut in stone by Mr. Tate of Newcastle. The breadth of the portico is 46 feet; and it projects over the broad flagged causeway of the street, forming a convenient covering for company alighting from carriages. The pedestals, columns, and pilasters in the front elevation are about 41 feet in height; and the whole is surmounted by a bold entablature, enriched with a modillion cornice, above which is a handsome balustrade, the angles being ornamented with vases carved in stone. The windows in the façade are arched and pedimented, so as to accord with the style of architecture. The front of the Theatre, with its bold projecting portico, is one of the most striking objects at the first glance up or down Grey-Street, and the more it is dwelt upon, the more does it gratify the eye of the observer.

The foundations of this building were laid in July, 1836, and the whole, with the exception of the portico, was completed in six months. Mr. Grainger is able to express without restraint his admiration of this great ornament of his principal street, as the honour of its design belongs exclusively to Mr. Benjamin Green.

Still ascending Grey Street, we come to the range extending from Market Street to Hood Street. It is commonly thought that the town has foregone a great advantage by the Corporation having hesitated so long about agreeing to Mr. Grainger's proposals about the employment of this ground as to compel him to withdraw his offer.

Great inconvenience is experienced at the assizes from the town and county courts being in different parts of the town; and also from various circumstances in the construction of the old courts. The area which we are now speaking of appeared to Mr. Grainger the right spot for the erection of new courts, being high ground in a central situation, and in every way convenient of access. He proposed to erect here town and county courts in one building (though as separate properties), and to combine with them the various council-chambers and offices of the corporate body, town-clerk, &c., a residence for the judges, and for the public entertainments of the mayor. Mr. Grainger offered to take in exchange for these new erections the Moot-hall (present county courts), the old Guild-hall, and other property, according to the valuation of arbitrators. The magistrates of the county of Northumberland agreed to barter the present Moot-hall for their New Court, if the Town-Council of Newcastle would accede to the proposal as far as it regarded them. The Town-Council were indifferent or doubtful, and they hesitated so long as to compel Mr. Grainger to use his ground for other purposes. It is believed that this apathy on the part of the Council has saved the architect 10,000*l*., but it has deprived him of the honour and satisfaction of conferring one great additional benefit on the town which is already incalculably indebted to him.

Parts of the design prepared for the proposed new courts have been preserved by Mr. Grainger in the range of buildings erected in their stead: 100 feet of the centre are occupied by the new District Joint-Stock Bank, which has private houses for wings. The basement front is supported by Doric pilasters. The centre above is recessed with arched windows, and the recess is adorned with Corinthian columns. Pilasters of the same order ornament the wings. The whole is surmounted by a balustrade, with urns in the intervals. The cornices of each story are adorned with richly-carved wreaths. The wings exhibit Doric pilasters and cornices like the centre. Mr. Grainger considers this the finest of the new erections.

Two more compartments finish the street. That between Hood Street and High-Friar Lane is of the Ionic order, with pilastered wings and recessed columns in the centre. From High-Friar Lane to Blackett Street is the plainest elevation of the whole series. It has a neat modillion cornice, differing from the rest, but no striking features.

In the centre of the north end of Grey Street, at its point of union with Grainger and Blackett streets, stands the Grey Column. It was erected by public subscription in honour of Earl Grey. The design was furnished by the Messrs. Green; and the statue of Earl Grey, by which it is surmounted, is by Bailey. The column not only forms a fine finish to this magnificent street, but is a striking object in approaching Newcastle in every direction. The great defect of the town as seen from a distance was, till lately, the absence of salient points for the eye to rest upon, a defect which the erection of this column goes far to remove. The statue was raised during the week of the meeting of the British Association, in August, 1838.

Thus much for Grey Street. The other streets, wholly the creation of Mr. Grainger, are:—

Grainger Street, 300 yards long and 66 feet wide. It is almost equal to Grey Street, two sections of it being the same designs continued.

Market Street, 190 yards long and 66 feet wide. Part of the elevations here also are the same designs continued.

Clayton Street, 516 yards long; and Clayton Street West, 220 yards long by 62 feet wide. These two streets consist of large private houses.

Nun Street, and Nelson Street, each 104 yards in length.

Wood Street, 78 yards by 50 feet.

Shakspere Street, 80 yards by 50 feet.

These streets all show fronts of polished stone in varied designs; and thus are nine new streets, of rare beauty, added to the town in the course of five years.

[To be continued.]

THE FLUTE.

The musical instrument to which we now apply the name of *flute* differs considerably from that known in past ages by the same name. Many of our translators of classical writers apply the word *flute* to the pipes which are so frequently alluded to in connection with the sylvan scenes of Greece; but many of those pipes appear to have borne a nearer resemblance to a modern flageolet than to a flute.

The history of the flute seems to consist of five different stages, the first ascending to the remotest antiquity. Most persons are aware that a small open tube, if blown into forcibly, will yield something approaching to a musical sound; and that if the tube be closed at one end —as in the instance of the barrel of a small key—a piercingly clear note may be produced by blowing obliquely into the tube. Now, it is probable that a simple tube, such as either of these, gave the first idea of a musical wind-instrument. But for the production of anything like melody one such tube was obviously insufficient, whether it were made of the shell of a fish, of the horn of a quadruped, of an oaten straw, or of a hollow reed, all of which appear to have been employed. It was therefore a notable advance when the suggestion was made to arrange several such tubes side by side, some larger than others. Who was the real inventor of this compound instrument is now perhaps impossible to be determined, but it has obtained the name of *pan-pipes;* and mythology ascribes it to Pan, who had a set of seven tubes of unequal length, connected together by means of wax, and who fixed on the number of seven, because of its relation to the number of the (then) known heavenly bodies. Without, however, dipping more deeply into the regions of mythology, we may deem it pretty certain that such a compound instrument as this has been known from the times of the Greeks to the present day; for there is no doubt that the modern *mouth-organ*, or *syrinx*,

is the same instrument in principle as the *pan-pipes* of the Greeks. The principle of this instrument may be soon understood. If we take two barrelled keys of different sizes, and blow into them one after the other, we shall find that the larger of the two will yield the lowest or gravest tone; and moreover, if we plug up a portion of the length of either pipe, the tone yielded will be higher than it was before. If we wish to have eight pipes which will yield the eight common tones forming an octave, we might select eight hollow reeds of different diameters and lengths, and plug up the lower end of each. If the sounds were not found to be in the desired proportion one to another, the plugs of some might be thrust a greater or a less distance into the tube, and thus the required effect might be produced; for the diameter of a pipe remaining the same, the sound yielded is more and more acute as the pipe is shortened. We are not here describing the method actually adopted by the ancients, for it is not well known how far they were acquainted with the musical intervals forming collectively what we call an octave; but we are merely explaining the fundamental principles of such an instrument.

The syrinx may be deemed the second stage in the history of the flute; and it was succeeded by another of great importance. Any one musical instrument, in order to produce melody, must be capable of yielding different tones; these tones were, as we have seen, produced in the syrinx by several pipes of different sizes; but in the change which we shall call the third stage, these several tones were produced from one pipe. It would be as useless to endeavour to discover the inventor of this improved pipe as the inventor of the syrinx: we may merely say that the shepherd's pipe, in some form or other, was known both to the Greeks and Romans. The circumstance which renders a pipe or tube capable of yielding different tones is by perforating it with holes in different parts of its length, which holes can either be covered by the fingers or left open. We have stated that when a tube is shortened, the tone yielded by it is higher in pitch. A perforation in the side of the tube is nearly equivalent to shortening it, because it allows the air to escape at a shorter distance than before from the mouth-hole; but if the perforation be stopped by the end of the finger, the instrument becomes as if it were unperforated. Pursue it farther, and suppose two perforations to be made: these would give to the tube three different effective lengths, according as one or both were open, or both closed. A farther increase in the number of perforations increases still more the power of varying the tones produced. As to the precise value of the differences between the tones, that would depend on the distances of the perforations one from another.

The third stage in the history of the flute is—a hollow tube, blown into at one end; and having several perforations in different parts of its length, which perforations are of a size to be easily covered by the finger. That such an instrument was extensively known among the ancients, there is abundant proof, derived from sculptures, pictures, coins, mosaics, and written descriptions. There were flutes of various denominations—curved, straight, small, middle-sized, single, double, right, left, equal, unequal, &c.; but it must be owned that the precise meaning of some of these terms is not now easy to determine; for instance, all we know about "right-hand equal flutes" is, that this is the interpretation given to the expression, *tibiis paribus dextris*, used by Terence; and that when he speaks of a player producing music *tibiis imparibus*, this is interpreted to mean "with unequal flutes." We may, however, state that double flutes were evidently often used, and it is probable that one of them was destined to yield lower tones than the others: this is rendered more probable by the circumstance, that some of these double flutes had no finger-holes, so that it was desirable to produce different tones from the two flutes. Some have supposed that the higher toned flute of the two was used to accompany gay and playful dramas; while the lower toned was appropriated to grave and serious pieces. Others again have supposed that the lower toned flute was used as a kind of drone, or continued bass, while the other performed an air. Be this as it may, there are many representations of ancient flute-players, in which the man holds a flute in each hand, and has a bandage fastened across his mouth, with a narrow slit in it; the object of this bandage may have been either to prevent the breath from passing out at the corners of the mouth, or to protect the cheeks from the bursting effects of blowing into a difficult instrument.

Dr. Burney endeavoured in vain to discover in what manner the sounds of these instruments were elicited. They were blown into at one end, like a clarionet; but whether they had a reed is doubtful: all clarionets, as well as some other instruments, have a little vibrating tongue, called a reed, near the mouth orifice; and the vibration of this reed gives the peculiar character to the sound of the instrument. Dr. Burney could never find any allusion to a reed of this kind; but he found reason to believe that a flute-player sometimes fixed a little tube to the end of his flute, in such a manner, that by drawing it out or thrusting it in, the pitch of the flute was changed—a contrivance very similar in principle to that adopted by the modern flute-player.

The use of pipes or flutes was by no means confined to the Greeks and Romans. There are many representations of such instruments among the rude drawings of the ancient Egyptians; and the modern Egyptian instrument, called the *Náy*, is probably a descendant, with some modifications, of the ancient Egyptian flute. Of this instrument Mr. Lane thus speaks:—"The *Náy*, which is the fourth and last of the instruments which I have mentioned as most commonly used at private concerts, is a kind of flute. There are several kinds of náy, differing from each other in dimensions, but in little else. The most common is that here represented. It has been called the durweéshe's flute, because often used at the *zikrs* of durweéshes to accompany the songs of the *moonshids*. It is a simple reed, about eighteen inches in length, seven-eighths of an inch in diameter at the upper extremity, and three-quarters of an inch at the lower. It is pierced with six holes in front, and generally with another hole at the back. The sounds are produced by blowing through a very small aperture of the lips against the edge of the orifice of the tube, and directing the wind chiefly within the tube. By blowing with more or less force, sounds are produced an octave higher or lower. In the hands of a good performer the náy yields fine mellow tones; but it requires much practice to sound it well. A náy is sometimes made of a portion of a gun-barrel."* This instrument is neither held like a clarionet nor like a modern flute, but in an inclined direction, sometimes towards the right and at others towards the left.

The instrument known in England by the name of flute in the beginning of the last century resembled more or less those of which we have been speaking. It was called the English flute, or flute *à bec*, from the upper end, or mouth-piece, being curved somewhat like the beak of a bird; and it was used in concerts to perform the same parts afterwards taken by violins. Sonatas for two flutes and a bass, and solos, duets, and concertos for the flute, were very common; but when the works of Corelli and other composers brought the violin more into vogue, the flute *à bec* gradually got into disuse. It was an imperfect instrument, and all the skill of the makers seems to have failed in removing the imperfections.

It is remarkable that nothing is known as to where or

* 'Modern Egyptians,' vol. ii., p. 71.

when the modern flute, called the German flute, was invented. It must be borne in mind, that all the instruments which have hitherto engaged our attention were blown into at one end; but the German flute is held nearly horizontal,—one end is plugged up,—and the mouth-hole, or embouchure, is in the side of the instrument, a few inches from the plugged end. There seems to be an impression, derived probably from the name, that it was first known or appreciated in Germany, though we know not by whom. M. Berbigueur, the eminent French flute composer, has advocated the following hypothesis respecting the origin of the flute *traversière*, or German flute. It is stated that in some of the monuments or inscriptions of ancient Egypt there are indications of the use of traverse flutes, or flutes crossing from right to left. There is also an hypothesis that a colony of Egyptians established themselves on the confines of Hungary and Bohemia, and became known by the names of Gypsies, Zingari, and Bohemians. The inference drawn from these premisses is, that the ancient Egyptians were acquainted with an instrument similar to the flute *traversière*, or modern German flute,—that the use of it was carried to Bohemia by a wandering band of colonists,—and that their neighbours the Germans, being a musical people, borrowed the idea from them, and gradually presented to other European nations an improved instrument which has obtained the name of the German flute. Without offering an opinion on this train of suppositions, we may remark, that if a person glance at Mr. Lane's representation of the manner of holding the Egyptian *náy*, and if he then consider the very oblique position in which some players hold the modern flute, it would require no great stretch of the imagination to deem one instrument to be similar to the other, although in effect one is plugged up at the end and the other is open.

Whatever be the origin of the German flute, we may consider it, in its most simple form, as the fourth stage in the history of the instrument; and that the gradual improvements which have been made in it (chiefly, we believe, by English makers) during the last fifty years, have brought it to a state of excellence which may be considered as its fifth or final stage; for it is doubtful whether its powers will ever be greatly extended beyond their present degree. Without detailing the purpose of all the improvements that have been made, we will give a general description of an eight-keyed German flute.

The best flutes are made of box, ebony, cocoa, ivory, or crystal: the two latter are objects rather of show than of use, for, independent of their high cost, it is found that the quality of the tone is not such as to make them desirable instruments. Box is less used than formerly, ebony being superior to it, and cocoa being the most sonorous and brilliant of all. The flute consists generally of four pieces, joining one to another, end to end, in a tolerably air-tight manner. The upper end is plugged up by a cork to which a screw is attached, and if the instrument be delicately made, the tone is affected by changing the position of this cork. The upper joint contains one perforation for the mouth-hole, the second contains three for the fingers of the left hand, and the third also three for those of the right hand.

The finger-holes are placed at such relative distances, that by closing one or more of them, all the major tones and some of the semitones may be produced, with an approximation towards correctness. But in order to produce the remaining semitones, and to render the others more nearly perfect, keys are employed. These keys may be regarded in the light of so many additional perforations; for beneath each key there is a hole, and the key is merely to keep that hole shut except for the production of certain notes. In an eight-keyed flute, therefore, there are not only six perforations, to be stopped by the fingers, but also eight others, stopped by keys; and as all these fourteen may be open at once, or closed at once, or any number of the fourteen open and the rest closed, it is obvious how much increase of power the player has to vary the number of changes in the position of the open holes. Generally speaking, an eight-keyed flute has two of the key-holes open, except when the keys are pressed down,—a contrary arrangement to that adopted in the other keys: these two keys are to enable the player to produce two notes (c ♮ and c ♯) lower than he could otherwise produce on the flute. Of the remaining six keys, five are to produce the D ♯, F ♮, G ♯, A ♯, and C ♮ more correctly than they could otherwise be produced; and the remaining one is useful in certain rapid passages. Flutes have been made with as many as eleven keys, in order to produce two additional semitones, and to increase the facility of playing some particular passages: but it is doubtful whether the increased effect is adequate to the increased complication of the instrument.

Should a flute player be playing in concert, and his instrument be a little sharper or flatter than the others, it would be desirable to have the means of changing the pitch of the flute. This is, to a certain extent, effected by having an air-tight sliding tube in the upper joint: by drawing this out, the effective length of the instrument is increased, and, as we before stated, the pitch thereby lowered. But this adjustment, if exceeding a small amount, throws the whole instrument out of time; for the distances between the finger-holes ought to be increased in the same ratio as the whole length of the flute: this has never yet been done, by any mechanical ingenuity, although an approach has been made towards it by some makers.

The embouchure and finger-holes of the modern flutes made in England and Germany are larger than those of the French flutes; the effect of which is this,—that although the latter are easier to play, the former, when well played, emit a greater volume of sound. This admission is candidly made by M. Berbigueur, who is well qualified to judge, and who says that a French flute has the *thin* quality of tone of a flageolet, when compared with a modern English flute.

The generality of flutes are made and tuned to concert pitch, that is, the c of the flute agrees with the c of the orchestra, but there are smaller flutes whose pitch is higher; especially one called the octave flute, whose notes are one octave more acute than those of the large flutes. The smaller kinds of flutes are not so liberally supplied with keys as the larger, so that their intonation is not so correct.

[Egyptian playing on the Náy.]

HORSE ARMOURY IN THE TOWER.—VI. Henry VIII.

[Henry VIII.]

We have now arrived at a period when the artificers of Italy and Germany had brought the armour to a degrce of splendour, before which the results of preceding efforts appear to dwindlc into insignificance. As a specimen of the workmanship of the early part of the sixtecnth century, it would be impossible to find anything of more valuc than the armour now in the Tower made for Henry VIII., and prcsented to him by the emperor Maximilian, and which is represented above.

It is not only the finest specimen of thc armour of the period now extant, but was doubtless considered one of the chefs-d'œuvre of the German artists, at the time it was made. It is to Sir Samuel Rush Meyrick that we are indebted for the knowledge of the fact, that this splendid suit belonged to the monarch under whose name it is now placed in the gallery, as well as for the discovery of the corresponding horse-armour. In the letter which Sir S. Meyrick addressed to the Society of Antiquaries on this interesting occasion, and which letter bears the date of March, 1827, he says :—" In the new arrangement of the horse-armoury at the Tower, which the Master-General and the Honourable Board of Ordnance were pleased to confide to my direction, I deemed it proper that several of the horses should be barbed, instead of allowing the armour for that purpose to remain indiscriminately mixed with the pieces on the walls. Having therefore ordered all of such description to bc brought to me, that I might put together those of a suit, I found some covcred with black paint, which, on holding to the light, appeared to me to contain a faint resemblance to engraving. On removing a portion of this coating, my conjectures were not only confirmed, but I instantly saw that these were the horse-armour for the suit hitherto considered as having been made for Henry VII., and which has the characteristic contour of the close of his reign.

" On the whole being sent to Enfield to be cleaned, I requested Mr. Lovell, the superintendent of the Small Armoury department there, whom I knew to be very skilful, to take accurate tracings of whatever was worthy of remark. The result has proved the suit to have belonged to Hcnry VIII., and exhibits a curious picture of the superstitious feelings of the times, which conceived a man's body to be doubly protected when not only shcathed in steel, but covered with the legends of saints."

This armour is washed with silver, and consists of a globular breast-plate, puckcred lamboys of steel in lieu of taces and tassettes, square-toed sollerets, a bourginot with a mentonnière to act as a gorget, and pass-guards on the pauldrons. The horse-armour is composed of a chanfron, manefaire, poitral, flanchards, and croupière; but the original saddle is wanting.

Surrounding the lower part of the horse-armour is the motto " Dieu et mon droyt;" and on the base of the lamboys, repeated all round, are the letters H. K., an inch and a half in height, of gilt brass, placed between two brass beads on the steel. On the breast-plate is engraved a figure of St. George, the patron saint of England, represented as having just " swinged the dragon;" and on the back-plate is a figure of St. Barbara. On one of the ' Jambes ' is the German word of congratulation " Gluck," *i.e.* Good Luck! from which it has been conjectured that it was on the occasion of the marriage of Henry to Katherine of Aragon that the armour was presented to him by thc emperor Maximilian. St. George is again represented on the front of the poitral (in the horse-armour), and various actions of his life on other portions of thc samc armour. On the croupière, the martyrdoms of St. Agatha and other saints are represcnted.

The badges of Henry VIII. and Katherine are engraved on many parts of the horse-armour, and on the fans of the genouillières of the king is the sheaf of arrows, the device adopted by Ferdinand, the father of Katherine, on his conquest of Granada, when he also assumed the pomegranate—a device which frequcntly occurs in this suit.

Besides the above subjects, the armour is profusely

decorated with arabesque and grotesque ornaments, such as basilisks, dragons, cupids, animals, &c.

The whole of the armour is in good condition, and precisely resembles that in which the king is depicted on his great seal, which bears a great similarity to the emperor Maximilian's own armour preserved in the palace of the Little Belvidere at Vienna.

The perfect and uniform appearance of this suit is such, that it only requires to be placed on figures having a greater resemblance to natural objects, to realise to the spectator the actual presence of the monarch as he appeared in one of those stately pageants, to which he was so partial, when rank and valour did their devoirs before the throne of beauty, and the king himself forgot, in the general obedience paid to the wishes of the ladies, the homage that was due to himself.

Unfortunately, however, the figures on which the armour of this collection is placed, are scarcely better than tailor's blocks, and the horses are, if it be possible, still more wretchedly executed. Formerly, we believe, there were several figures of horses in the Tower carved in wood by or under the direction of the celebrated Grinlin Gibbon; we know not what has caused their removal, but we cannot think it could have been to make room for those which now fill the gallery. Who would recognise in the uncouth objects before him a representation of the noble war-horse animated with the fire that lightens up his master's countenance, and pawing the ground impatient for the fray? We might certainly look upon them and exclaim with the poet—

> "How firm the manag'd war-horse keeps his ground,
> Nor breaks his order, though the trumpets sound!
> With fearless eye the glittering host surveys,
> And glares directly at the helmets' blaze!"

But however well this picture of the docility of the horse is represented in these figures, there is nothing about them to lead us to imagine the animal capable of the action and vivacity for which he has been celebrated by so many writers.

Leaving, however, this subject, we must continue our account of the progress of arms and armour.

The principal feature in the armour of the time of Henry VIII. is the lamboys, which, introduced in the reign of his father, formed a distinguishing part of this and the following reign. These were generally appended to the breast-plate, but, when this was not the case, tassets and cuisses, composed of several plates instead of one, were worn upon the thigh. The lamboys greatly increased in dimensions shortly after its introduction, and in this reign, as will be seen from the engraving, had attained a complete resemblance to a full petticoat. In addition to the embellishments hitherto employed, a kind of armour called 'raised armour' was now introduced, the ground being kept black, whilst the pattern, raised about the tenth of an inch, was polished.

Puffed and ribbed armour, in imitation of the slashed dresses of the day, was also occasionally worn, some very fine specimens of which are still preserved at Goodrich Court in the Meyrick collection.

The tilting helmets were but seldom used, a headpiece called a coursing-hat, with a mentonnière, being worn instead; from this a plume of feathers hung down behind, sometimes to a great length, as represented in the seal of Henry VIII., where it is depicted as very long and full.

The varieties of weapons introduced are but few; and these unimportant, if we except the pike, which, having been introduced into France by the Swiss in the time of Louis XI., soon made its way over Europe. From this time to the reign of William III., pikemen composed a principal part of the infantry of the English army.

The pertuisane, or partisan, a variety of the pike or spontoon, must also be enumerated as one of the new weapons of the time of Henry VIII., as well as the pistol, the dag, or tacke (a different sort of pistol), and the application of the wheel-lock to hand-guns.

EXTERNAL STIMULANTS.

It seems probable that even the earliest practice of physic was not purely tentative, but was founded on the observation of nature's methods of relieving disease. In no instance is this more likely to have been the case than in the use of external stimulants. A man, for example, was subject to constant headaches, which ceased on the appearance of an eruption on the back of his neck; the eruption disappeared, and the headache returned; what could be more natural than to attempt to supply its place by some stimulating application? Instances of the relief afforded to severe internal disease by a slight external ailment are not uncommon; and there are cases where the removal of the latter has led to the fatal termination of the former. Several of these are mentioned by Dr. Granville, in his work on 'Counter-Irritation.' In one instance, a young lady had a purulent discharge behind the ears, which a surgeon cured with an ointment containing corrosive sublimate. A few weeks afterwards she was taken ill on the Continent, after moderate dancing, and died of an affection of the heart in forty-eight hours. On examination it was found that the right ventricle of the heart contained an earthy calculus.

The death of Louis XVIII. followed close upon the healing of most of the old sores in his legs.

A gentleman who is subject to large boils every spring and autumn, is wretchedly low and miserable while they are painful; but when suppuration is fully established, his health and spirits improve, and in six weeks he becomes a new man in feelings and appearance. On one occasion, however, he stopped the progress of the boils with leeches and preparations of lead; in consequence of which both his life and intellect were in danger.

In a fourth case, a gentleman had an obstinate scaly eruption (*psoriasis*) on the palm and back of his right hand. Attempts were made to cure it, but in vain. The patient consulted Dr. Granville, whose opinion was that all attempts to check the eruption suddenly should be given up, and might be fatal. This advice, however, was disregarded; and many years afterwards Dr. Granville saw the gentleman with his hand quite smooth—the effect of some empirical pomatum. "He was then labouring under every symptom of unmitigated dyspepsia, accompanied by a dull heavy incessant pain in the right side. He died almost unexpectedly a twelvemonth after, aged forty-four years; and on examination, a large tumour, containing purulent matter, was found, placed between the liver and duodenum, and connected with both."

Again, when children are affected with some copious eruption, and this is checked too suddenly, water in the head or inflammation of the membranes of the brain is apt to follow, and a trivial disease is exchanged for one of frightful severity. "On the other hand," says Dr. Granville, "children affected with either of the two latter very serious complaints were often brought under my notice, who suddenly got well on the spontaneous appearance of the before-mentioned eruption, or upon the back of the ears becoming suddenly and extensively sore."

In all these instances the advantage of the counter-irritation caused by nature is obvious: whether we suppose the benefit to result merely from the morbid process in the skin supplying the place of a similar action in more important organs; or whether we believe, with the partisans of the humoral pathology, that some noxious matter is actually eliminated from the blood, in the boil, ulcer, or eruption. The humoral pathology, we may observe, after having reigned in the schools from the very commencement of the history of physic, suffered a temporary eclipse of forty or fifty years; but for some

years past it has strongly tinctured medical doctrines, and bids fair to regain it former ascendency. Among the public it has never lost its influence, and the theory that an eruption is a "humour" appearing on the skin, has always been the popular one. The humoral pathology certainly solves a thousand riddles, and one is inclined to favour it almost instinctively. The delicious feeling of ease experienced after the suppuration of a crop of boils, does not arise merely from the removal of the irritation caused by their presence, for it is infinitely superior to the state of the patient before the first appearance of the boils. How natural then to conclude that the agreeable change has been chiefly produced by the expulsion of some noxious matter!

However this may be, it is certain that the imitation of nature by the use of external stimulants has formed a part of the practice of physic from the earliest times. One of the most obvious of these remedies is the actual cautery, or red-hot iron. This was apparently an habitual application with Hippocrates, who says, "What medicine does not cure, steel cures; what steel does not cure, fire cures; but what fire does not cure, is incurable." This practice was common as late as the last century; for we read that in Pott's early days the irons were regularly heated for the round of the surgeons at St. Bartholomew's Hospital. But with the progress of time, surgery, like law, has become more lenient; and in this country at least the actual cautery is rarely employed. When skilfully applied, it is not so severe as might be imagined; it instantaneously destroys the life and sensibility of the parts to which it is applied; and the true skin (as well as the cuticle) being killed, the pain after its employment is not very great. The neighbouring skin is protected by wet linen or plaster, and the patient is thus spared the pain which would result from its half-destruction. Still, however, there is something revolting in the remedy, and it is fortunately but seldom if ever necessary.

Scalding water is another method of applying heat as a counter-irritant; it was sometimes adopted at Paris in cases of cholera.

Moxa, says Sir William Temple, is an Indian moss used in the cure of the gout by burning it on the part aggrieved. According to Mr. Davis, in his 'History of China,' the Chinese prepare their moxa by bruising the stems of an artemisia, called *gae-tsaou*, in a mortar, and then selecting the most downy fibres. The moxa is also used in rheumatism, and perhaps in tic douloureux; but it is rarely employed in this country.

Blisters are probably more used than all other methods of counter-irritation put together, and therefore deserve a more detailed account. One of the names by which the blister-fly is known in scientific zoology is *Cantharis vesicatoria;* and Hippocrates employed an insect for blistering, which he calls κανθαρις (*cantharis*). Still it is not certain that he used the same fly, though it was one of a kindred quality; and from the description of the blister-fly given by Dioscorides and Pliny, it is clear that their cantharides were not identical with ours.*

The blister-fly is often called the Spanish fly, as it was formerly imported from Spain. It is found in France, Germany, Hungary, Russia, and other parts of Europe; and is imported from St. Petersburg, and also from Messina in Sicily.

The blister-fly "has an elongated or almost cylindrical shape; its length is from six to ten lines (rarely longer); its thickness one or two lines: it has a golden green colour, and a nauseous unpleasant odour. The body is covered with whitish grey hairs, which are more numerous on the thorax than on the head, abdomen, or legs."†

* Pereira, in 'Medical Gazette,' vol. xvii., p. 593.
† Pereira, in 'Medical Gazette,' vol. xvii., p. 594.

These insects are not applied to the body in substance, but always after having been mixed with other materials. The following, for instance, is the formula for the blistering-plaster of the London College of Physicians:—"Take of cantharides, rubbed to a very fine powder, a pound; wax plaster, a pound and a half; prepared lard, a pound. Sprinkle the cantharides in the plaster and the lard, melted together and removed from the fire, when just about to become solid, and mix the whole together."

This is usually spread upon leather, leaving a margin covered with adhesive plaster, to make it stick to the skin.

The Edinburgh Pharmacopœia directs the blistering-plaster to be made with equal parts of cantharides, resin, bees'-wax, and suet. It also contains a compound blistering-plaster, made of Venice turpentine, Burgundy pitch, cantharides, bees'-wax, verdigris, white mustard-seed, and black pepper. This is more stimulating than the common plaster, and is intended to raise a blister more quickly; "thence it is adapted for cases of gout and cramps of the stomach, in which the effect of the blister must be almost instantly produced. Its operation is accompanied with great pain, and a pungent sense of heat: it is apt to cause very unpleasant ulceration if allowed to remain too long applied."*

The French Codex has two blistering-plasters. The first is made with four ounces of each of the following articles:—resin, lard, bees'-wax, and cantharides; with the remark, that in summer there is to be an ounce less of lard, and an ounce more of wax. The second plaster is called the *emplâtre vésicatoire Anglais*, and is composed of equal parts of wax plaster, lard, and powdered cantharides; so that it differs from the London formula only in the proportion of its ingredients, and there but slightly.

But enough of the method of preparing blisters; let us now bestow a few words on their practical application. Blisters are used in large classes of disease; in inflammatory ailments, in nervous ones, and in those frequent distempers which seem to hold a middle place between the two, and may be termed diseases of irritation. Their visible effect is to raise the cuticle (or scarf-skin) from the cutis (or true skin), and cause serum to be poured out between them; their secondary effect is very commonly to mitigate the inflammation or pain for which they were prescribed. In some irritable habits blisters destroy the true skin, and thus cause a very unpleasant ulceration. After a blistering-plaster has remained on the skin six, eight, or ten hours, it is removed; the blister is cut, in order to let out the serum, and the place is dressed with spermaceti ointment. Sometimes it is thought desirable to keep up the stimulus, and the spot is dressed with savine ointment; but the continued irritation is apt to make an ugly sore, and it is better practice to allow the place to heal, and then apply another blister.

The principal precautions to be observed in the application of blisters are—

1st. That the blister is not to be too large; for a skin-deep wound of great size destroys life like a stab in a vital organ. This error rarely occurs in regular practice; but the loss of life caused by the skin-deep wounds of a late empiric renders this hint necessary.

2ndly. A blister is not to be applied during the acute stage of inflammatory disorders, or while much fever is present; though it may do good service when the force of the inflammation has been lessened by bleeding and other measures.

3rdly. Blisters are not to be used in persons of a dropsical habit; nor in very irritable patients, unless under urgent circumstances, and then only of small size, lest they should cause too much fever.

* 'The London Dispensatory,' by Dr. A. T. Thomson, 9th edit., p. 866.

4thly. For the reason just given, blisters are not to be rashly applied to infants or young children. In the few cases where they may be thought absolutely necessary, they must be left on for a short time only, as from two to four hours; or the blister-plaster of the Pharmacopœia may be diluted with a proper quantity of soap cerate.

Mere slips of blistering-plaster put behind the ears of young children are employed with advantage to relieve the head or eyes; and are also useful in adults.

Before dismissing the subject of blisters, we may mention that, in 1810, Robiquet discovered that an active principle, to which Professor Thomson of Glasgow gave the name of *cantharidin*, could be separated from the blistering-fly. Many of our readers are aware that this is one of a series of similar discoveries which have been made within the last thirty or forty years. Thus the narcotic part of opium, the emetic principle of ipecacuanha, and so on, can be obtained in a separate form.

A grain of *cantharidin* dissolved in alcohol, and mixed with one ounce of lard, is said to make a very active ointment.

There is a blistering-liquid made by soaking cantharides in acetic acid. It is intended for raising blisters suddenly.

Tartar Emetic Ointment.—This is an excellent counter-irritant, and is much used in modern practice. The common strength is, or was, a drachm of the tartar emetic to an ounce of lard or spermaceti ointment. In the late editions of the London and Edinburgh Pharmacopœias, the strength is 1 to 4, instead of 1 to 8.

Dr. Jenner, in his treatise 'On the Influence of Artificial Eruptions' (London, 1822), says, that the general strength should be a drachm of the tartar emetic to an ounce of simple cerate; but he remarks that in some cases it is necessary to make it stronger, when he prescribes the following compound: two drachms of tartar emetic, nine drachms of spermaceti ointment, a drachm of white sugar, and five grains of the red sulphuret of mercury. He says that sugar prevents the ointment from becoming rancid.

"A patient applied the ointment according to the preceding formula, at night, and had eruptions next morning, which was within a space of twelve hours. He had, however, used the same on a preceding occasion in cold weather, and with a skin less perspirable; in this instance it was much tardier in vesicating." (Jenner, p. 54.)

We surmise that Jenner put "vesicating" by a slip of the pen; the effect of the common tartar emetic ointment is to produce not vesication, but an eruption much resembling small-pox; and though the effect might be slightly altered by the red sulphuret of mercury, we do not think the compound ointment would blister.

The common method of using the tartar emetic ointment is to rub a bit as big as a hazel-nut or larger on the part affected, night and morning, until pustules appear. The part is then washed, and the application discontinued, lest ulceration should ensue. Four or five rubbings will commonly suffice, or fewer, if the ointment is strong, or the skin very irritable. The preceding extract from Jenner afforded an example of this; here is another from the same work:—

"In the case of a lady, where two parts of the tartar emetic and one of simple cerate were used, eruptions appeared in a few hours." (p. 54.)

Potash.—This alkali in its caustic state is much used as a counter-irritant, particularly in diseases of the spine and hip-joint. Caustic potash is procured by evaporating the solution of potash, and when it melts, pouring it into proper moulds. The sticks of caustic thus made are kept in well-stopped bottles, as they deliquesce (or melt down) by the contact of air. When applied to the skin, caustic potash corrodes it, and forms a soapy compound with it. Caustic potash is a curious example of the changes which have continually occurred in chemical and pharmaceutical nomenclature. Thus it has been called *Kali purum*, *Lapis causticus*, *Potassa fusa*, and *Causticum commune acerrimum*. Another of its names, *Cauterium potentiale*, or potential cautery, was given it by way of opposition to the *Cauterium actuale*, or actual cautery. In the London Pharmacopœia it is now called *Potassæ Hydras* (or hydrate of potash), and in the Edinburgh Pharmacopœia simply *Potassa*.

[To be continued.]

Lending Books.—Those who have collected books, and whose good-nature has prompted them to accommodate their friends with them, will feel the sting of the answer which a man of wit made to one who lamented the difficulty which he found in persuading his friends to return the volumes which he had lent them. "Sir," said he, "your acquaintances find, I suppose, that it is much more easy to retain the books themselves than what is contained in them."—*Andrews' Anecdotes.*

Arab Mode of tracing Footsteps.—The Arab who has applied himself diligently to this study, for it is only to be acquired by long practice, can generally ascertain, from inspecting the impression—1, whether the footsteps belong to his own or to some neighbouring tribe, and consequently whether friend or foe has passed; 2, he knows, from the slightness or depth of the impression, whether the man who made it carried a load or not; 3, from the strength or faintness of the trace, whether he passed on the same day or one or two days before; and 4, from a certain regularity of intervals between the steps, a Bedouin judges whether the man is fatigued or not, and hence he can calculate the chance of overtaking him. This faculty of distinguishing footsteps on the ground extends to beasts (horses and camels) as well as men, and, in the exercise of it, the same observations will lead to the same results.—*Robinson's Travels in Palestine and Syria.*

Effect of Employment on the Insane.—The occupation of the patients has always formed a leading feature in the regulation of the Hanwell Asylum, and has given it a celebrity throughout Europe. The bazaar, the gardens and farm, the laundry, the bakehouse, the brewhouse, the kitchen, the shops of the smith and carpenter, the shoemaker and tailor, are thus converted into so many convalescent wards. In whatever part of the establishment work of any kind is going on, some patients are in some way or other furnished with a little occupation; and this employment tends in many cases to advance the recovery of those who are beginning to improve, and affords opportunities for little tests of self-control and temper which are valuable preparatives for being returned to society. There are also several incurable patients, whom daily but not severe occupation relieves from most of the misery attendant on their mental condition. Many insane persons who wish to be employed, and to whom employment is extremely useful, are incapable of regular application to any employment whatever. Their work, at the best, is desultory, and often imperfect, and for severe labour their malady and their diet equally disqualify them; but the value of occupation, even of the lightest kind, to themselves, can scarcely be over-stated. As much care as possible is taken that those who cannot be induced to join in any kind of work should be as long as possible prevented from sinking into total inactivity. Notwithstanding every attention, there are some in whom this progress to inertness and torpor cannot be prevented. Examples may be seen in this, as in all asylums, of patients who will sit motionless from morning to night; doing nothing for days, weeks, or months, but when urged to action; seldom or never speaking; sometimes requiring to be fed like children; but the functions of their limited degree of life continuing, although feebly, and so as to make its extinction at all times a probable event.—*Report of Doctor Conolly, Resident Physician at the Hanwell Lunatic Asylum.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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THE NEWCASTLE IMPROVEMENTS.—No. VI.

[Continued from No. 519.]

[Grey Street, Newcastle.]

The following is a summary of five years' work of Mr. Grainger, from August, 1834, to August, 1839.

The old property removed consisted of two theatres, the late butcher-market, Anderson Place (large mansion and offices), one large inn, eight public-houses, eighty private houses, and a great number of workshops and inferior buildings.

The site of the improvements cost	.	£145,937
Workmen's wages and materials	.	499,753
Total	.	645,690

Out of this have arisen the following:—nine new streets (extending collectively one mile two hundred and eighty-nine yards), the new market, the central exchange, new theatre, new dispensary, music-hall, lecture-room, two chapels, incorporated company's hall, two auction marts, ten inns, twelve public-houses, forty private houses, and three hundred and twenty-five houses with shops.

Annual rental of occupied houses and shops		£17,416
When fully occupied, it will be	. .	40,000
Value of the property	. . .	800,000

This, with former new erections, amounts to 995,000*l.* Thus nearly a million has been added to the value of the town by one man in five years, confining the estimate to the narrowest pecuniary consideration of the case.

The value of other property in the town has risen and is rising. The common complaint of the place is that there are no houses to be had. The other architects and builders of Newcastle have more to do, the more Mr. Grainger does. The importation of Baltic timber has become considerable. Two thousand workmen at a time have been employed by Mr. Grainger alone, and the presence of their prosperous families is, in every way, an advantage to the town, the population of which is at this time increasing at the rate of fifteen hundred a year. It would be thought on the Continent a great credit to a state to have done in the same period what we now witness at the hands of this charity-boy.

It will be seen that he is no less remarkable as a man of business than as an artist. No one supposes that he cares for money for its own sake; but he plainly shows that it is of great importance to him as the grand instrument of carrying out his designs, and that he chooses to neglect no fair means of obtaining it for this end. He has obtained 8000*l.* from the Newcastle and Carlisle Railway Company, in compensation for a disappointment about the situation of the terminus of their railway, which was to have been on his property at Elswick. In erecting his new streets he bethought himself of the lighting of the additional shops and public buildings, and required the Gas Company to enter into a contract with him; to which they agreed. This Company paid him nearly 25,000*l.* upon his guarantee that his tenants should obtain their gas-light, whether little or much, from the Company—a stipulation to which his tenants find no reason to object. He has sold a good deal of his Grey Street property, and has parted with more to the District Bank. The continual demand for houses makes him

more rather than less anxious to consult the good of all parties in peopling the new property. He now builds a house up to a certain point, and finishes it, to the convenience and taste of the tenant, after it is let. He thus does all he can to ensure the permanency of residence of his tenants.

The moral requisites to such achievements as Mr. Grainger's are no less remarkable than the intellectual. It is clear that he could not have effected what he has without having first inspired his neighbours with a strong confidence in his integrity. Gentlemen who have had to receive periodical payments from him declare him to be the most regular payer they ever had to do with. His workmen regard him as something like the sun for his punctuality and the unremitting character of his operations. They have occasionally tried him with strikes, but he has always been too much for them. We remember, on one of the first of these occasions, the excitement in the town at the news that Grainger's men had struck, and the curiosity to see what he would do. There he was in the midst of his stone and timber, as serene as a summer's morning, secure in his plans. Before the evening, he had sworn in six hundred apprentices. Being asked what he would do with so many novices, he answered that his excavations were just then his chief object, and the boys could excavate under his directions. So they did; the men offered themselves in crowds again presently. He picked and chose from among them—those whom he rejected being left at leisure to bewail their strike.

Much of his composure is doubtless owing to natural temperament; but there must also be some strong principle of self-control restraining the impetuosity on the one hand, and the anxiety on the other, to which enterprising minds are liable. It is said that Grainger was never seen out of temper; nor does his quiet cheerfulness ever appear to give way. When we consider how often his plans have certainly been thwarted—what noble designs he has been compelled to surrender—what opposition and disparagement he has encountered for years from such of his townsmen as have wrongly imagined that his interests were incompatible with theirs, and that in the conduct of such vast pecuniary affairs, through seasons of commercial fluctuation, a thousand difficulties and perils must have arisen—when too we take into the account the annoyances to which the master of two thousand workmen and the occasional servant of various public bodies must be subject day by day, it is clear that something far beyond common good-nature has been the means of bringing him through without injury to his health or peace of mind. We believe so from the facts that are seen and reported. He appears to be on the best terms with his brother architects—a fact honourable to him and to them. He is very popular among his men, finding leisure to consider their interests, and pleasure in extending his generosity to their families. Finally, while all the world knows what prodigious designs he hopes yet to work out, distancing even his past achievements, it is believed that he keeps his affairs arranged with such exactness to the smallest particulars, that in case of the most sudden death no one will suffer from the magnitude of his schemes, and that they may be carried on by some successor, if a worthy one can be found. These facts surely indicate that some deep principle of reliance lives and works within him, at once inspiring his genius and establishing his tranquillity of mind.

It may be asked whether no professional misfortunes have occurred in this wonderful career. We believe, only one of any importance. In the summer of 1836 the shells of three or four houses fell in while the workmen were employed upon them, and several lives (about eight, we believe) were lost. This accident has never been accounted for from any discoverable defect in the work; and as it is the only one, and there was no difference between the plan and execution of these houses and those of all the others in the same street, it is concluded by most people that the accident was caused by a thunderstorm which was at the moment passing over the town. There are not wanting persons who still predict, as they have done from the beginning, that accidents will happen, and who find fault, now with the foundations, and now with the superstructure of Grainger's works; but till such accidents do happen, the majority of observers are disposed, reasonably enough, to conclude that Grainger himself best understands the nature of the ground he builds upon, and is most interested in the security of his own property.

As for what remains to be done, a brief sketch of what is known of Mr. Grainger's intentions may fitly conclude our notices of him.

Mr. Grainger seems to have early thought that the energy and resources employed in other districts to extend manufactures might here be best used, at least in the first instance, in improving the convenience and beauty of the town, and in providing habitations for an increased population of the most valuable class. This done, and the results he anticipated being evident to all eyes, he now appears to contemplate raising the place in the rank of manufacturing districts. The great manufactures of the region are glass, alkali, and iron and brass founding. Mr. Grainger's aim seems now to be to afford a wide scope for these, while facilitating to the utmost the commerce of the port. He has purchased the great Elswick estate, lying along the river, west of the town. It consists of seven or eight hundred acres, and he paid 200,000*l.* for it. It contains natural wealth of various kinds, and among others extensive quarries of fine stone, and a spring of water, so pure and plentiful that he thinks of affording a new and superior supply of water to the whole town. His plan comprehends the junction of several railroads, the formation of extensive quays, the erection of ranges of manufactories, and on the high grounds behind, of villas and terraces. If he lives to complete his scheme, the inhabitants will see the Infirmary, now standing on a green eminence between the outskirts of the river, the centre of the town. A new bridge, so lofty as to permit shipping to pass under it, is projected by the Messrs. Green; and it is so much wanted, that it is easy to foresee that it will not continue a mere project. If this plan should meet with no serious impediment, and if Mr. Grainger lives to convert his Elswick estate to his own purposes, there is no anticipating what the town of Newcastle may become. If it should rise to the utmost conceivable magnitude and prosperity, no one will forget that it owed its main impulse and extension to Richard Grainger, the charity-boy.

EXTERNAL STIMULANTS.

[Concluded from No. 519.]

Ammonia.—This alkali is much used as a counter-irritant. It is generally employed only as a rubefacient, that is, to produce a reddening of the skin; but with proper management it will blister. Let us consider a few of its preparations.

In France, an ammoniacal *pommade* is sometimes prescribed with advantage, as in the following case mentioned by Dr. Granville. A mason, having been picked up senseless after a fall from a scaffold, was carried to the *Hopital de la Pitié*. After a long treatment, he was discharged nearly cured; but in a few months epilepsy came on, and he was re-admitted. Dr. Serres, the eminent physician under whose care he was placed, believing the fits to arise from inflammation of the spine, prescribed local bleeding, which afforded some relief, but did not much diminish the number of fits. "At length a cerate was prepared, made by mixing caustic ammonia with purified butter of cacao, which, being spread on linen, was applied over and along the spine. By this means the

part became blistered in a short time, and was brought into a state of active surface-discharge, through which the paroxysms of epilepsy became less frequent and less important, until they at last ceased entirely." (Granville, p. 177.)

Preparations of hartshorn and oil are very frequently used. The liniment of ammonia of the London Pharmacopœia is composed of one part of solution of ammonia to two of olive oil; this is stronger than is requisite for a mere rubefacient, and in practice it is commonly diluted with a further portion of oil. The corresponding preparation of the French Codex (the *Liniment ammoniacal*, or *Liniment volatil*) has only one part of solution of ammonia to eight of oil. These embrocations are applied externally in cases of sore-throat, and will often relieve chronic rheumatism. The compound camphor liniment of the London Pharmacopœia is a very stimulating embrocation, being composed of seven parts and a half of solution of ammonia, with twenty of spirits of lavender, holding two and a half of camphor in solution.

But the strongest is one recommended by Dr. Granville in the work above quoted, where he omitted to give its composition, but afterwards published it in a medical journal. The Edinburgh College appear to have adopted it in the late edition of their Pharmacopœia, where we find the following formula:—

"Take of stronger Aqua Ammoniæ (D. 880), five fluid ounces;
Tincture of Camphor, two fluid ounces;
Spirit of Rosemary, one fluid ounce: mix them well together."

Ammoniacal liniments of such a strength as this will sometimes raise a blister in a few minutes, and, under good advice, are excellent applications in those critical cases where an instantaneous effect is a matter of imperious necessity. When this is wished for, linen soaked in the liniment is to be applied to the part, and evaporation is to be prevented by a bandage over the linen. This liniment applied to the back of the neck would, no doubt, often relieve head-aches; but so, indeed, will blisters, or tartar-emetic ointment. When head-aches arise from a foul stomach, languor, or fatigue, other remedies will be more appropriate; but when the cause is obscure, and irregular circulation within the brain may be suspected, the effect of this brisk counter-irritation is often most satisfactory.

Having thus discussed several external stimulants pretty fully, we will mention some others more briefly, lest our essay should swell to an inconvenient length.

Mustard is frequently used as a rubefacient. Besides redness of the skin, it sometimes excites vesication, and, when applied too long, has been known to cause gangrene. The volatile oil of mustard is far more active, and is used either pure, or mixed with equal parts of spirits of wine, according to the effect which it is wished to produce.

The mineral acids, particularly the sulphuric and the nitric, are violent caustics, and instantaneously corrode the skin; the former turning it brown, the latter orange-coloured.

Sir Benjamin Brodie, in his treatise on the diseases of the joints, recommends a liniment composed of one part of sulphuric acid to three of olive oil in inflammation of the synovial membranes of joints.

Creosote.—A substance discovered about seven years ago, and prepared from the oil of wood tar, is a powerful stimulant. An ointment made with one part of creosote to eight of lard has been used in one form, at least, of scalled head (porrigo scutulata).

Nitrate of silver (lunar caustic) is milder than caustic potash. Besides its use in substance as an application to warts and sores, it is used in solution as an eye-wash, in the proportion of two or more grains to the ounce of distilled water. One or two drops of this wash are put into the eye twice a day, in some of the slighter degrees of inflammation, and often with a good effect.

Oil of Turpentine (commonly called spirits of turpentine) is a stimulant of some note. The turpentine liniment, composed of soft-soap, camphor, and oil of turpentine, is used as a stimulating application to burns, according to the plan of Dr. Kentish.

If we wish for a milder stimulant than any we have yet mentioned, there is the *soap-liniment* of the London Pharmacopœia, made with three ounces of soap, one of camphor, and sixteen of spirit of rosemary. This is a useful application in chronic rheumatism, especially when aided by friction.

We will close our list, which might be indefinitely prolonged, by mentioning *acupuncturation*. This means the process of piercing the skin with needles, as a relief for nervous and rheumatic pains. It is a useful method of treatment, but does not happen to be much in fashion just at present. We have thus endeavoured to gratify a liberal curiosity by giving the names and uses of some of the principal remedies which are employed externally as stimulants; and it can hardly be necessary to caution the uninstructed reader to refrain from using them without proper advice. Many of them, if incautiously applied, would cause ulceration or even gangrene; and if swallowed, as too often has been the case from the carelessness of attendants or the insufficiency of labels, would be poisons.

Yet there are occasions where the layman is obliged to act as if skilled in surgery; for instance, the commander of a vessel which carries no surgeon; and it is then desirable to know what external stimulants he may include in his medicine chest, with the smallest chance of mischief. We should be inclined to recommend small blisters ready spread and cut into sizes by the druggist; a few ounces of tartar-emetic ointment; and a pint or two of soap-liniment. Take care, we would add, not to use these stimulants during the fever; discontinue the frictions with the ointment when the first pustules appear, and wash off what remains on the skin; and lest it should be mistaken for spermaceti ointment, let it be coloured with a little rose pink.

With such precautions these remedies will seldom do harm, and often, it is to be hoped, good; yet the cleverest shipman must not expect that the study of half an hour shall be equivalent to the experience of years.

Sagacity of the Horse.—The late General Pater, of the East India service, was a remarkably fat man. While stationed at Madras, he purchased a charger, which, after a short trial, all at once betook himself to a trick of lying down whenever he prepared to get upon his back. Every expedient was tried without success to cure him of the trick, and the laugh was so much indulged against the general's corpulency, that he found it convenient to dispose of his horse to a young officer quitting the settlement for a distant station up the country. Upwards of two years had subsequently elapsed, when, in the execution of his official duties, General Pater left Madras to inspect one of the frontier cantonments. He travelled, as is the usual custom in India, in his palankeen (a covered couch carried on men's shoulders). The morning after his arrival at the station, the troops were drawn out; and, as he had brought no horses, it was proper to provide for his being suitably mounted, though it was not very easy to find a charger equal to his weight. At length an officer resigned to him a powerful horse for the occasion, which was brought out, duly caparisoned, in front of the line. The general came forth from his tent, and proceeded to mount; but the instant the horse saw him advance, he flung himself flat upon the sand, and neither blows nor entreaties could induce him to rise. It was the general's old charger, who, from the moment of quitting his service, had never once practised the artifice until this second meeting. The general, who was an exceedingly good-humoured man, joined heartily in the universal shout that ran through the whole line on witnessing this ludicrous affair.—*The Plain Englishman.*

HORSE ARMOURY IN THE TOWER.—VII. Henry VIII.

[Continued from No. 519.]

[Henry VIII.]

Besides the splendid suit of armour made for Henry by command of the Emperor Maximilian, the Tower possesses another of the same date, exhibiting the more common costume of the knights of the time. This is represented in the above engraving, and will be found to be sufficiently described in the account of the military costume of this reign, given in our last paper. It is a suit of plate-armour, gilt, and much ornamented; and is known to have been in the possession of the monarch under whose name it is placed in the collection. The figure holds in its hand a *martel de fer*, and carries a fluted sword at the right side.

Perhaps at no time was the fashion of armour so chaste as at the period of which we are now treating. Each piece is adapted to the form of the body, and while the whole is sufficiently strong for every purpose of defence, the engraving and ornaments with which it is adorned give it an appearance of lightness and elegance which is not injured by any grotesque or uncouth adjuncts, such as disfigure the armour of preceding times. But the reign of Henry was characterised by considerable refinement in matters of this nature, and jousts and tournays, masques, fetes, and pageants became not only of frequent occurrence, but were conducted with the utmost magnificence and display, while knighthood appeared to gain new lustre from the gallant and chivalric conduct of the nobles of Henry's court. Every occasion of public rejoicing was eagerly seized as a pretext for soliciting the king's sanction to some joust or tournament; and if no such pretext offered itself, the king's licence was requested for the pleasure of the ladies and the gentle exercise of chivalrie.

The disposition of the king when young—gay, gallant, open, and liberal—rendered him partial to such amusements, and his pride and love of display induced him to render them as imposing as rich dresses and bright armour, and silks and cloth of gold, would admit of. Throughout his reign, and even when his general character altered so as to deserve the censure which all historians have bestowed upon him for his violence, cruelty, arrogance, bigotry, &c., he was still the patron of all knightly sports, and often partook himself of the exercise and of the honour attendant on the tournaments held at his court.

Although, as we have said, every occasion of public festivity was eagerly made the pretext for the "exercise of feats of arms," it appears to have been usually the practice to celebrate the month of May, in particular, by some such exhibitions. Several jousts are recorded to have been held at Greenwich in this month during the reign of Henry VIII., and in one of the articles prescribed for the regulation of a "passage of arms" held for such a purpose (which articles are preserved in an old MS. in the British Museum), it is directed that "a green tree shall be set up in the lawne at Greenwiche Parke the xxii[d] daye of Maie, whereupon shall hang by a green lace a white shield" on which knights of good birth are invited to subscribe their names in answer to certain challengers who then proposed taking the field "against all comers." At one of these May sports the king himself, accompanied by the Duke of Suffolk, the Earl of Essex, and Sir George Carew, is recorded to have challenged all comers to joust and to tilt at the barriers. This was on the 20th of May, in the 8th year of the king's reign.

It was occasionally the practice of knights, when challenging others to the lists, to adopt fictitious names or characters, and an instance of this occurred in the second

year of the reign of Henry, when the birth of Prince Edward was celebrated by great feastings and sports. On this occasion four knights, calling themselves "Loyal Heart," "Valiant Desire," "Good Valour," and "Merry Thought," challenged all comers to the Tilt, Joust, and Tourney; and from the names of those who accepted the challenge (preserved in the MS. before alluded to), which included the highest and most noble knights of the court, we should conceive the exhibition to have been one of great magnificence. No less than twenty noblemen answered the challenge of this quadruple alliance.

An application to the king for leave to erect lists for the exercise of arms in honour of the month of May, which appears to have been personified by the speaker, some comely youth or close-shaved gentleman, and which speech has been preserved from oblivion by having been hidden in the pages of a musty MS. from the date of its delivery, abounds with so much quaintness that we cannot resist the temptation of extracting the whole speech, which was probably delivered in one of those masques by which the lords and ladies of the court were so often entertained in the reign of Bluff King Hal.

"Most high and excellent Prince: I, which am called the Lady Maie, in all months of the yeare, to lustie hearts most pleasant, certify your highness howe that under signe and seal, fully authorised by the hand of my lady and souvereign Dame Somer, I have free licence, during the time of my short reign, to pass my time and a fortenight in the moneth of my sister June, as shall be to my comfort and most solace; and therefore I being thus at my free liberty, taking my leave from her and her lusty and courageous court all the months of March and April, for to view the maner of all the whole dominions of my said ladye, have sailed in the stouring seas in this shippe, apparelled and taekled after my judgment as to my nature is appropriate, and accompanied, for the surety of my person, with divers gentlemen and yeomen, apt and active to any exercise that shall of them be demanded. And whereas I am so fortunable to make my first arrival in this most famous streame of honnor—fountaine of all noblesse—and part most renowned, called the realme of England, I have availed my sailes, as it appeareth; and in token my mind is determined here to abide, I have cast out myne anchors, under the support of your gratious licence, to rest me and my said servants, which have been long travaile in the stormy season of March and Aprill, humbly beseeching your grace not to be miscontent that I so boldly have enterprised arrivale without your gracious licence afore obteyned. But in manner I was enforced so to do; as I came sailing along the coast, and heard newes to me not very pleasant, how that Winter, a great enemy of my lady's, not long ago was honoured in the month of February, by the reason of exercise of feates of arms, the fame of which is not hid in all the rest of the world; that hath raised in me haste to speed me hither; and with my coming my heart is somewhat rewyred, for I set in mind that noble courageous hearts are determined to have my Ladye Somer in exercise of chivalric. And for to stirre them the sooner to the said feates, I, the Ladye Maie, humbly beseech your grace to licence my poor servants to exercise against all comers in ways of pleasure and pastime all such articles as hereafter ensweth; not doubting but, your gracious licence obtained, all gentle courageous heartes will do as great and greater honour unto me, the lustye Ladye Maie (comfort of all lustye heartes), as they did lately to the servant of the Ladye Winter, Dame Februarie."

Then is recited the articles of the justes to be held the "fowerteenth daie of Maie, at Grinwiche," and to be continued all that month and a fortnight in June, "the Sondayes exeluded." There is no date to this; but from the names affixed to the articles, "Charles Brandon (D. of Suffolk), Richard Blunt, Giles Capell," &c., it must have taken place in the reign of Henry VIII.

We have not thought it necessary to allude to the 'Field of the Cloth of Gold' and other celebrated 'Passages of Arms' of this time, as these are well known; but before we conclude, we may mention that until the close of his life, Henry VIII. continued to take the greatest pleasure in all such "gentle exercise," and was himself a patron or spectator of most of the jousts and tilts which took place in his realm. In the thirty-second year of his reign, a magnificent display of the nature we have been describing took place at the Tilt-yard, Westminster, at which the king was present. On this occasion Sir John Dudley, Sir Thomas Seymour, Sir R. Cornwall, Sir Thomas Poynings, Sir George Carewe, and Sir Anthony Kingston, were the challengers; and it is recorded that they "kept open house, with all manner of feasting," from "Friday, the last day of April, till Friday, the 7th of May," at Durham Place, near the Strand, to which "resorted to dynner, supper, and banquetting, divers tymes, the king's majestie and the queene, with other his nobles and gentlemen."

DISCOVERY OF THE NORTH-WEST PASSAGE.

[In a previous number (No. 389) we gave an account of the efforts of Messrs. Simpson and Dease to discover the North-West Passage by a land journey. This object has now been effected in a second journey performed by the same enterprising gentlemen, and we subjoin the narrative of it in their own words.]

(*Despatch received at the Hudson's Bay House.*)

Fort Simpson, October 16, 1839.

Honourable Sirs,—We have the honour to report the completion of all the primary objects of the expedition, the entire fulfilment of Governor Simpson's original instructions, under which it has been our good fortune to act, and something more, though, as we plainly told your honours last winter, it was quite out of the question to think of reaching the Strait of the Fury and Heela from the Coppermine River.

On the 22nd of June we descended that impetuous stream of the Bloody Fall, where we remained until the 28th. This interval was employed by Mr. Simpson in exploring Richardson's River, discovered in 1838, which discharges itself, as we then supposed, into the bottom of Back's Inlet, in latitude 67° 53′ 57″ north, longitude 115° 56′ west. A party of about thirty Esquimaux were encamped there, all of whom fled precipitately to the hills, except one family, whose tent was placed on an island in the stream. With these last a communication was opened, through our interpreter Ooligbuck; but the circle of their little lives being confined to the Beren's Isles and the borders of Richardson's River, they had no information to impart of any value.

On the 3rd of July the first slight opening occurred in the sea ice, of which we took instant advantage; but our first week's journey did not exceed twenty miles, and it was the 18th, after sad work, before we could attain Cape Barrow. From its rocky heights we beheld, with equal surprise and delight, the wide extent of Coronation Gulf partially open, whereas, long after the same date in 1838, the whole party might have crossed it on foot. At midnight on the 20th we landed at Cape Franklin, just one month earlier than Mr. Simpson's arrival there on his pedestrian journey of the year before. A violent easterly gale arrested our progress for the next four days; and on the 27th and 28th we encountered great peril in doubling Cape Alexander amidst very heavy driving ice.

From Cape Alexander, situated in lat. 68° 56′ N., long. 106° 40′ W., to another remarkable point in lat. 68° 32′ N., long. 98° 10′ W., the Arctic coast may be comprised in one spacious bay stretching as far south as lat. 67° 40′ before it turns off abruptly northward to the last-mentioned position. This vast sweep, of which but

an inconsidcrable portion was seen by Mr. Simpson last year, is indented by an endless succession of minor bays, separated from one another by long, narrow, projecting points of land, cnclosing an incalculable number of islands.

From this description it will be evident that our route was an extremely intricatc one, and the duties of the survey most harassing; but whilst perplcxed bcyond measurc in finding our way through these labyrinths, we derived great advantage from the proteetion afforded by the islands from the crushing force of the seaward ice; and the wcather was generally clear. In fact, the most serious detention caused by ice on this part of the voyage was from the 1st to the 5th of August, on a point that jutted out beyond thc insular ehain.

White Bear Point, as it was callcd, lies in 68° 7′ 85″ N., 103° 6′ 45″ W., variation 54° 45′ E. These bays and masses of islands prcsent a distinct succession of geological features, which ean be bcst illustrated by our series of specimens of the rocks that eompose this wild and barren coast. Vestiges of Esquimaux, and mostly old, were met with wherever we landed.

They appear to subsist in single families, or very small parties, and to travel inland for the decr hunt in the month of June, not returning to their sealing islands till thc ice sets fast in October. A river, twicc the size of the Coppermine, whieh falls into the sea in 68° 2′ N. lat., 104° 15′ W. long., is much resorted to by reindeer and musk-oxen in the summer season. Finding the coast, as already remarked, trending northerly from the bottom of the Great Bay, we expected nothing less than to be carried round Cape Felix of Captain James Ross, contrary to thc eonjecture hazarded by Mr. Simpson, in his narrative of last year's journey. On the evening of the 10th of August, however (at the point already given), we suddenly opened a straight running to the southward of cast, where the rapid rush of the tide scarcely left a doubt of the existence of an open sea leading to the mouth of Back's Great Fish River. This strait is ten miles widc at cither cxtremity, but contracts to three in the eentre. Even that narrow ehannel is much encroached upon by high shingle islands, but there is deep water in the middle throughout. The 12th August was signalised by thc most terrific thunderstorm we have ever witnessed in these regions. Next day it blew roughly from the westward, with a very dense cold fog, but we ran rapidly south-cast, past Point Richardsou and Point Ogle of Sir George Back, and continued on till the darkness of the night and the increasing gale drove us on shore beyond Point Pcchell. The storm shifted to north-east, and lasted till the 16th, when we directed our course, with flags flying, to the Montreal Island. On its northern side our people, guided by Mackay, soon found a deposit made among the rocks, by somc of Sir George Back's party, but, as Mackay seemed to think, without that officer's knowledge. It containcd two bags of pemican, and a quantity of cocoa or chocolate, all pcrfectly rotten, bcsidcs an old japanned tin vasculum, and two or three other trivial articlcs, of whieh we took possession, as mcmorials of our having breakfasted on the idcntical spot where the tcnt of our gallant though less successful precursor stood, on his rcturn from Point Ogle to the Great Fish River, that very day five years before. The arduous duty we had, in 1836, undertaken to perform, was thus fully accomplished; and the length and difficulty of the route back to the Coppermine would have amply justified our immediate return. We had all suffered more or less from the want of fuel and the deprivation of warm food; and the prospects grew more eheerless as the cold fall weather stole on apace. But having already ascertained the separation of Boothia from the American continent, on the wcstern side of the Great Fish River, we determined not to desist till we had settled its relation thercto on the eastern side also. A fog, which had come on, dispersed towards evening, and unfolded a full vicw of the picturesque shores of the æstuary. Far to the south, Victoria Headland stood forth so clearly defined that we instantly recognised it by Sir George Back's exquisite drawing. Cape Beaufort we almost seemed to touch, and with the telescope we were able to discover a continuous line of high land as far round as north-east, about two points more northerly than Cape Hay, the extreme eastern point seen by Sir George Back.

The traverse to the farthest visible land occupied six hours' unremitting labour at the oar, and the sun was rising on the 17th when we scaled the bluff and singularly-shaped rocky cape to which our eourse had been directed. It stands in lat. 68° 3′ 56″ N., long. 94° 35′ W. The azimuth compass, by Jones, settled cxactly in the true meridian, agreed with others by the same maker placed on the ground.

From our proximity to the magnetic pole, the compass had latterly been of little or no use; but this was of the less eonsequence, as the astronomical observations were very frequent. The dip of the needle, which at Thunder Cove (12th August) was 89° 29′ 35″, had been decreased to 89° 16′ 40″ N. This bold promontory, where we lay wind-bound till the 19th, was named Cape Britannia, in remembrance of our glorious country. On the bcetling rock that sheltered our encampment from the sea, and forms the most conspicuous objcct on all this part of the coast, we erected a conieal pile of ponderous stones, 14 feet high, that, if not pulled down by the natives, may defy the rage of a thousand storms. In it was plaeed a sealed bottle containing a sketch of our proceedings, and possession was taken of our extensive discoveries in the name of Victoria the First, amidst the firing of guns and the enthusiastic cheers of the whole party.

On the 19th the gale shifted from north-east to east-south-east, and after crossing a fine bay, due east, with no small toil and danger, the coast bent away north-east, which enabled us to effect a run of 40 miles. Next day the wind resumed its former direction, and after pulling against it all the morning among the shoals and breakers, and gaining only three milcs, we were obliged to take refuge in the mouth of a small river.

From a limestone ridge, about a league inland, we obtained a view of some very remote blue land in the north-east quarter, in all probability one of the southern promontories of Boothia.

Two eonsiderablc islands lay far in the offing, and others, high and distant, stretchcd from east to east-north-east. Our view of the low main shore was confined to five miles in an easterly direction, after which it appeared to turn off greatly to the right. We could, therefore, scarcely doubt our having arrived at that large gulf uniformly describcd by the Esquimaux as containing many islands, and with numerous indentations stretching down to the southward, till it approaches within 40 miles of Repulse and Wager Bays. The exploration of such a gulf, which was the main object of the Terror's ill-starred voyage, would necessarily demand the whole time and energies of another expedition, having a starting or retreating point much nearer to the scene of operation than Great Bear Lake, and it was quite evident to us that any further foolhardy perseverance could only lead to the loss of the great object alrcady obtained, together with that of the whole party. We must here be allowed to express our admiration of Sir John Ross's extraordinary escape from this neighbourhood, after the protracted endurance of hardship unparalleled in Arctie story. The mouth of the stream which bounded the last career of our admirable little boats, and rceeived thcir name, lies in lat. 68° 28′ 27″ N., long. 97° 3′ W., variation of the compass 16° 20′ W.

The strong wind that had forbidden our advance gave wings to our retreat. The same night (August 20) we landed once more at Cape Britannia, and next morning recrossed the inlet direct to Point Pechell with a heavy

sea. On the 22nd we explored a long narrow bay on the west side of Point Ogle, which extends to the 68th parallel of latitude. The north wind blew roughly, with sharp frost, and next day we got no farther than Point Richardson. Thence we crossed over, on the 24th, to what had from the continent appeared like two islands, but which we rightly conjectured to form part of the southern shore of Boothia, or, to speak with greater precision, of that land on which stands Cape Felix of Captain James Ross. This shore we had the satisfaction of tracing for about 60 miles, till it turned up to the north, in lat. 68° 41′ 16″ N., long. 98° 22′ W., only 57 miles from Ross's Pillar; the dip of the needle was 89° 28′ 45″ N., the magnetic pole bearing north-north-east, distant 90 miles. The variation, as shown by both the azimuth compass and the horizontal bar needle, was 45 degrees east. The objects seen on this coast are easily enumerated. A low uninteresting limestone tract, abounding nevertheless in reindeer, musk-oxen, and old native encampments. To the westward a good deal of ice appeared, and vast numbers of snow-geese passed high over-head in long triangular flights, bound for milder skies.

Whilst engaged in taking observations, our men constructed another durable memorial of our discoveries, which was saluted in the usual manner. Then recrossing the strait on the 25th, we resumed for some time our outward route, only keeping more along the seaward verge of the islands, so as to shape a straighter course.

The weather, from being threatening and unsettled, soon became unequivocally severe.

On the 29th of August a severe snow-storm began that lasted for seven days, during four of which we were fixed to a single spot by the violence of the north-west gales, while the frost was so keen that the pools among the rocks on which we lay became solid enough to bear up a man. A more moderate interval succeeded this fierce outbreak. Quitting the continent again at the large river already mentioned, we struck north-north-west for an extensive island 22 miles off, which we coasted (north-west) for 20 miles, and shortly before sunset on the 6th of September stood out from thence due north for the nearest point of Victoria Land, which proved equally distant.

We have never seen anything more brilliant than the phosphoric gleaming of the waves when darkness set in. The boats seemed to cleave a flood of molten silver, and the spray dashed from their bows before the fresh breeze, fell back like showers of diamonds into the deep. It was a cold night, and when we at last made the land, cliffs, faced with eternal ice, obliged us to run on for a couple of leagues before we could take the shore with safety. The coast of Victoria Land, which we explored for upwards of 150 miles, is incomparably the boldest we have met with in these seas. Often near the shore no bottom could be found with 35 fathoms of line, and the cerulean blue colour of the water everywhere indicated a profound depth. There are several noble bays, the largest of which, north-west of Cape Alexander, is 20 miles wide and equally deep, backed by snow-clad mountains. It attains to 69° 40′ north, the highest latitude of this voyage. At length we reached the extreme point seen by Mr. Simpson from Cape Franklin in 1838, where the coast of this large country begins again to bend northward of west, Cape Barrow being by computation south-south-west, distant 50 miles. On the 10th of September we crossed this magnificent strait, with a strong east-south-east or side wind, and a rough sea, in which our gallant boats, old and worn out as they were, acquitted themselves beyond our most sanguine hopes.

Our return from Cape Barrow was miserably retarded by furious north-west winds and severe stress of weather. Winter permanently set in on the 15th of September, and next day, to the undisguised joy of the whole party, we re-entered the Coppermine River, after by far the longest voyage ever performed in boats on the Polar Sea. Leaving one of our little craft, together with the remains of the pemican (which, through age and long exposure, was become quite mouldy), and various other articles, as a prize for the first Esquimaux who may visit the Bloody Fall, we ascended the river with our double crew in four days; abandoning our tents, and everything but absolute necessaries, we crossed the Barren Grounds up to the knees in snow, having unluckily left our snow-shoes on the coast, and safely reached St. Confidence at dusk on the 24th. The fisheries had failed sooner than ever, and we had good reason to congratulate ourselves on not being doomed to pass a third winter within the Arctic circle.

After settling with the Indians, liberally rewarding the most deserving, and supplying all with ammunition gratuitously, we took our departure on the evening of the 26th, in two inland batteaux—one belonging to the expedition, the other came from Fort Simpson sixteen days before our arrival.

Our passage of Great Bear Lake was most boisterous and inclement; in crossing the body of the lake, and other considerable traverses, our boats, with everything in them, and even the very clothes on our backs, became converted into shapeless masses and concentrations of ice. It was high time for us to escape from Great Bear Lake, for the temperature, which was at four degrees below zero when we landed at the head of the river on the evening of the 4th of October, fell ten degrees below it in the course of the night; and next day we descended the rapid stream in the very midst of the driving ice. On entering the Mackenzie, we experienced a temporary mitigation of this excessive cold; but we should most assuredly have stuck fast above Fort Norman, had not the northern gales again rose in their strength, and while they shattered and dispersed the rapidly forming ice, enabled us to stem the current under close-reefed sails. At noon, on the 14th of October, after forcing our way with no small risk through the torrent of ice poured out by the rivers of the mountains, we reached this place, and were cordially welcomed by our valuable friend Chief-trader M'Pherson, who had for some time given up all hopes of our arrival.

Most of our people are still afflicted with acute pains and swelling in the limbs, caused by the cold and exposure; and we are assured by Mr. M'Pherson that he has never known or heard of so rigorous a commencement of winter in Mackenzie's River. On the other hand, so fine a spring as 1839 seldom visits these frozen regions; and to this favouring circumstance, under Providence, ought our signal success to be partially ascribed.

Oct. 30.—The state of the ice at length enables us to despatch couriers to the Slave Lake. In the meantime, Governor Simpson's highly valued letter of 17th June, which unfortunately missed us in our way hither, has cast up overland.

We rejoice in having anticipated the Russian expedition, and secured to our country and the Company the indisputable honour of discovering the North-West Passage, which has been an object of search to all maritime nations for three centuries.

When our expedition was planned at Norway House in 1836, it was confidently expected that Sir George Back would have achieved the survey of the Gulf of Boothia with the Terror's boats, and that our meeting at the mouth of the Great Fish River would have left no blank in the geography of Northern America. That officer's failure, the exhaustion of our men and means, and the necessity of a new wintering ground, render a fresh expedition indispensable for the examination of the Gulf of Boothia, the circuit of which, to the strait of the Fury and Hecla, according to the Esquimaux accounts, cannot be less than 400 or 500 miles.

It only remains for us to recommend to your approba

tion the plan proposed by Mr. Simpson to perfect this interesting service, which, as he had no wish to avail himself of the leave of absence granted, he is prepared to follow up whenever the limited means required are placed at his disposal. We have the honour to be your most obedient humble servants,

Peter W. Dease.
Thomas Simpson.

To the Governor, Deputy Governor, and Committee of the Hudson's Bay Company, London

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Vitality of Seeds.—Without admitting such doubtful cases as those of seeds preserved in mummies having germinated, there are many instances of seminal longevity about which there can be no doubt. Books contain an abundance of instances of plants having suddenly sprung up from the soil obtained from deep excavations, where the seeds must be supposed to have been buried for ages. Professor Henslow says, that in the fens of Cambridgeshire, after the surface has been drained and the soil ploughed, large crops of white and black mustard invariably appear. Miller mentions a case of Plantago Psyllium having sprung from the soil of an ancient ditch which was emptied at Chelsea, although the plant had never been seen there in the memory of man. De Candolle says, that M. Gerardin succeeded in raising kidney-beans from seeds at least a hundred years old, taken out of the herbarium of Tournefort; and I have myself raised raspberry plants from seeds found in an ancient coffin, in a barrow in Dorsetshire, which seeds, from the coins and other relics met with near them, may be estimated to have been sixteen or seventeen hundred years old.—*Dr. Lindley's Theory of Horticulture.*

Circumstances which determine Physical Climate.—The aspect of a country has an influence upon its climate, for this reason, that the angle at which the sun's rays strike the ground, and consequently the power of those rays in heating it, varies with the exposure of the soil relatively to that luminary. When the sun is elevated on the meridian 45° above the horizon, his rays fall perpendicularly on the side of a hill facing the south at an equal angle, while the plain below receives them at an angle of 45°. Supposing the north side of the hill to have a similar slope, the rays would run parallel to its surface; and their effect be very trifling, but if the declivity were still greater, the whole surface would be in the shade. This, though an extreme case, serves to show why temperature varies with the inclination of the earth's surface. Since the warmest part of the day is not when the sun is on the meridian, but, owing to the accumulation of the heat, two or three hours afterwards, it follows that, in our hemisphere, a south-south-west or south-western aspect is the warmest, and a north-north-east or north-eastern the coldest, if no local circumstances exist to make it otherwise. The effect of aspect is, of course, most strikingly seen in regions covered with high mountains. In the Valais in Switzerland, the Alps are on one side covered with ice, while vineyards and orchards flourish on the other. Mountains affect a climate in more ways than one. They attract the vapours in the atmosphere, and causing them to condense, give rise to those violent rains which are often experienced in the neighbourhood of lofty ranges. They also afford shelter from winds. In narrow valleys, the sides of which in summer strongly reflect the sun's rays, this shelter sometimes renders the heat very injurious. One reason why the central and southern parts of European Russia are exposed to greater cold than their latitude and inclination southward would lead us to expect, is the absence of any chain of mountains to protect them from the full influence of the winds blowing from the White Sea and the Ural Mountains. The inhospitable climate of Siberia arises from its descent towards the north, exposing it to the winds of the Frozen Ocean, while at the same time the vast mountainous chains that cross central Asia intercept the southern winds, whose access would tend to mitigate the rigour of the atmosphere. It is evident that the nature of the soil must very materially operate upon climate. One soil acquires heat, keeps its acquired heat much longer, or reflects it more readily than another. One which from its porous character allows the rain descending upon it to pass freely into the earth, will emit much fewer exhalations than one which retains the water near the surface. Thus clayey or marshy grounds lower the temperature, and, especially in hot and humid climates, affect the atmosphere in a manner pernicious to health; on the other hand, those which are light, stony, or calcareous, tend to make the atmosphere salubrious. The great cold and the unwholesome air that prevail in the Russian governments of Astracan and Orenburg, lying to the north of the Caspian Sea, are attributed partly to the saline nature of the soil; and it is well known that the arid tracts of sand in Africa and Arabia conduce not a little to the excess of heat under which those countries labour.—*Physical Geography, published under the Superintendence of the Society for the Diffusion of Useful Knowledge.*

Importance of Registration.—A faithful register of births, marriages, and deaths, is wished for by enlightened philanthropists of all advanced countries, far more as a test of national morals and the national welfare, than as a matter of the highest social convenience. For this the physiologist waits as the means of determining the physical condition of the nation; as a guide to him in suggesting and prescribing the methods by which the national health may be improved, and the average of life prolonged. For this the legislator waits as the means of determining the comparative proneness of the people to certain kinds of social offences, and the causes of that proneness; that the law may be framed so as to include (as all wise laws should include) the largest preventive influence with the greatest certainty of retribution. For this the philanthropist waits as a guide to him in forming his scheme of universal education; and without this,—without knowing how many need education altogether,—how many under one set of circumstances, and how many under another,—he can proceed only in darkness, or amidst the delusions of false lights. He is only perplexed by the partial knowledge, which is all that his utmost efforts enable him to obtain. If he goes into every house of every town and village in his district, he is no nearer to an understanding of the intellectual and moral condition of the nation than he was before: for other districts have a different soil and different occupations; the employments of the people, their diseases, and their resources, are unlike; and, under these diverse influences, their physical, and therefore moral and intellectual condition, must vary. The reports of philanthropic societies do little more for him, drawn up as they are with partial objects and under exclusive influences: parliamentary disclosures are of little more use. Vague statements about the increase of drunkenness, resistance to one kind of law or another, alarm and distress him; but such statements again are partial, and so often brought forward for a particular object, that they afford no safe guide to him who would form a general preventive or remedy. Thus it is under all partial methods of observation; but when the philanthropist shall gain access to a register of the national births, marriages, and deaths, he will have under his hand all the materials he requires, as completely as if he were hovering over the kingdom, comprehending all its districts in one view, and glancing at will into all its habitations. The comparative ages of the dead will indicate to him not only the amount of health, but the comparative force of various species of disease; and from the character of its diseases, and the amount of its health, much of the moral state of a people may be safely pronounced upon. The proportion of marriages to births and deaths is always an indication of the degree of comfort enjoyed, and of the consequent purity of morals; and, therefore, of the degree in which education is present or needed. A large number of children, and a large proportion of marriages, indicate physical and moral welfare, and therefore a comparative prevalence of education. A large number of births, and a small proportion of marriages, indicate the reverse. When these circumstances are taken in connexion with the prevailing occupations of the district to which they relate, the philanthropist has arrived at a sufficient certainty as to the means of education required, and the method in which they are to be applied.—*How to Observe: Morals and Manners, by Harriet Martineau.*

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THE RYE-HOUSE.

[The Rye-House.]

To the disciples of Izaak Walton, the house represented in the above engraving is well known, as marking a spot where they are sure to find good employment for their angle; but it has obtained a more extended celebrity from its being the house in which the conspirators, who intended, it was said, to have murdered Charles II. on his road from Newmarket, were to have assembled to put their plans in execution.

The Rye-House is situated on the River Lea, near its junction with the Stort, and contiguous to the village of Hoddesdon in Hertfordshire. It is on the east bank of the river, but at a short distance from it; an alehouse, which has adopted the well-known name of the building, being situated south of it, on the side of the road to Stansted Abbots and Harlow. This alehouse has been from time immemorial the favourite resort of London anglers when the Lea has been the scene of their operations; and it is doubtless to this that the cheerful Izaak alluded when he speaks of the "honest alehouse, where we shall find a cleanly room, lavender in the windows, twenty ballads stuck about the wall, and a hostess both cleanly, handsome, and civil." The house, however, now is altogether modern; but still maintains its character for liness and civility.

The only portion of the Rye-House now standing is an embattled gate-house, built of brick and ornamented with a handsome stone Gothic doorway. This was formerly used as a workhouse for the poor of Stansted, in which parish it is situated, and it is still inhabited by some of the old women who occupied it before the Poor Law Amendment Act rendered it necessary to provide other accommodation for the paupers of the union in which the parish of Stansted is included. The chimneys of that portion of the house still remaining are very curiously constructed; and at one of the angles of the building there is a turret with an ancient winding staircase in the interior.

The house and grounds forming the manor of Rye formerly occupied considerable space, which was surrounded by a moat, since partly filled in, so that it formed a small island, and was accordingly sometimes named the Isle of Rye. The house was built in the reign of Henry VI., by Andrew Ogard, to whom the king granted a licence to impark the whole, consisting of 85 acres.

In the time of Elizabeth it was occupied by Sir Edward Baest, 'surveyor-general of her Majesty's victuals for the seas;' and from him it came into the possession of Edmund Fielde, Esq., in whose family it still remains.

At the time when it was to have been used for the purposes of the 'Protestant Plot' of 1683, it was tenanted by a man of the name of Rumbald, a maltster, who, it was alleged, was to have secreted the conspirators in his house and afford them an opportunity of retreat after their purposes had been effected.

The intent of the conspirators, according to the information of Josiah Keyling, a salter, was to waylay the king, on his return from Newmarket, and to shoot both

him and the Duke of York, who was expected to accompany him. The manner of doing it was proposed to be thus:—Rumbald's house being by the highway-side, the undertakers were to hide themselves under a wall or pale; and when his majesty's coach came opposite to them, three or four were to shoot with blunderbusses at the postillion and horses; and if the latter did not drop, two more of the party, dressed like labourers, were to rush out of a lane near the place with an empty cart, which they were to draw athwart the way, in order to stop the horses, while several others of the gang fired on the king and his guards. For this purpose they were to provide "six swan-quills, twenty goose-quills, and twenty or thirty pair of crow-quills" (meaning in their plot-jargon so many blunderbusses, muskets, and pistols), with "ink and sand" (powder and bullets) in proportion. The maltster, however, went down to his house at Rye without any of his associates, without arms, or any actual preparation; and whilst he was there the king and duke passed close by his house on their way to London with only five of the Life Guards; so that the king would have fallen an easy prey to them had they been prepared for him. The king's unexpectedly early return was, it is said, owing to a fire having broken out in his apartments at Newmarket; but it is more than probable that had he waited until the time at which he was expected, he would have passed uninjured, as there is every reason to believe that the whole accusation was false, and that, like many of the previous Popish plots, as they were called, it was got up by some of the more unhesitating and violent adherents of a party, and with the most reckless false swearing and perversion of the truth. The imagination of the witnesses in this case procured every day some fresh impeachment, and when the malice of the Popish party had secured the condemnation of their humbler victims, they gradually brought their foul suspicions to attach to the most noble characters. It was on a charge of aiding the conspirators in this pretended plot that those high-minded patriots Russell and Sydney were tried and convicted, against the evidence produced, and in defiance of all legal right. Rumbald, the maltster, escaped at the time, but was subsequently taken when accompanying the Duke of Argyle in his landing in Scotland in 1685, and suffered a most cruel death. Although severely wounded at the time of his capture, "he was hoisted up by a pulley and hanged awhile, he was let down scarce fully dead, and his heart pulled out, and carried on the point of a bayonet by the hangman." He, however, resolutely denied the truth of the Rye-House Plot.

LACE, AND ITS MANUFACTURE.

The history of lace is a remarkable one. Thirty years ago was the period at which the middle and humble classes began to use productions which, though not actually lace, bore a strong resemblance to it; we mean bobbin-net. Before that period, lace, in all its forms, was the production of human labour, unaided by any machinery, except a few pins, a few little sticks, and a cushion; and the cost of production was so high, that none but the wealthy could afford to purchase the lace thus made. Since that time machines have been invented, amplified, and improved to such an extent, that a light and elegant material, answering the purposes of hand-made lace, has been brought within the reach of almost all classes of the community. It is computed that nearly thirty millions of square yards of bobbin-net are made annually in England, chiefly in the neighbourhood of Nottingham. We have given several statistical details of the bobbin-net trade in 'Penny Magazine,' vol. iii., p. 278: the present article will relate to other parts of the subject.

Beckmann has endeavoured to discover how far back the making of lace may be traced, but he could not find any details in the ancient authors to warrant the assumption that what is now called lace was known among them. There have, however, since his time, been plates of Grecian costume published, in which the female dresses are seen to be bordered with lace. The embroidered lace, or that which is worked with a needle, was more ancient than pillow-lace or bone-lace; and lace of the former kind is sometimes found among old church furniture, from which it is probable that it was the production of nuns or of pious ladies of fortune, who had time to devote to such an exceedingly slow and tedious employment. This production probably originated in Italy, and from thence was introduced into Germany and France. Beckmann attributes the invention of pillow-made lace to Barbara Uttmann, a native of Saxony, about the year 1560. The annalists of Saxony have made especial mention of this circumstance, because it was of considerable importance at the time. The mines of Saxony had become less productive than formerly, and the miners' wives, who were principally employed in making veils by the old slow method of needle-work, could scarcely earn sufficient to support them. The new method of making lace was found to be so much more rapid, that it was soon learned by all the wives and daughters of the miners, and the lace which they manufactured, on account of the comparatively low price at which it could be produced, soon became fashionable, in opposition to the Italian lace worked with the needle, and even supplanted it in commerce.

Under the ministry of the celebrated Colbert, the lace manufacture, as then practised in Brussels, was introduced into France. Count de Marsan brought from Brussels to Paris his former nurse, whose name was Dumont, and her four daughters, in 1666. These were all lace-makers, and they received an exclusive right to establish and carry on the lace manufacture in Paris. In a little time Dumont and her daughters collected more than two hundred females, many of whom were of good families, who produced such excellent work, that it soon acquired a reputation both in France and elsewhere. It is certain that before this period the making of lace was very common in Flanders and Belgium. De Reiffenberg states that there is a series of six engravings now existing, by Martin de Vos, Dubruyn, and Londerseel, executed about the year 1580. These represent human occupations at different periods of life. In one of them is a young woman seated, with the apparatus in her lap for making pillow-lace.

Mechlin, Brussels, Valenciennes, and a few other continental towns, continued to be the principal marts for lace. During the seventeenth century there was quite a rage for this production, men as well as women wearing it in profusion: and even down to the end of the last century it was calculated that nearly ten thousand females were employed at lace-making in Brussels alone. Since that time the production of machine-made bobbin-net in England, and to a smaller extent on the Continent, has greatly reduced the amount of pillow-made lace. Valenciennes, which used formerly to be one of the chief places of its production, had not, in 1825, more than three hundred persons employed at it.

The period of the introduction of lace-making into England cannot be well ascertained, but it appears to have been somewhere about the reign of Queen Elizabeth, and to have been occasioned by the persecution of the Lollards in Flanders. Honiton in Devonshire was one of the first places at which it was carried on in England. At this town the manufacture was very flourishing in the time of Charles I. During the early part of the reign of George III., Honiton lace was much patronised by the royal family, and the manufacturers at that place employed upwards of 2400 persons in the town and its neighbourhood. By the year 1822 this number, probably on account of the increase in the bobbin-net

manufacture, had fallen to 300. What is the number of persons employed at the present time we do not know; but the recent Royal marriage has shown that Honiton lace is yet an object of demand. Generally speaking, we believe the thread employed in making Honiton lace is imported from Antwerp, the British thread being considered inferior for that purpose.

The counties in England where the manufacture of thread-lace is carried on are principally Devonshire, Buckinghamshire, and Bedfordshire. Bone-lace (as thread-lace was then called) was made at Olney in Buckinghamshire in the time of Fuller, and after that gradually extended throughout the greater part of the county. At the beginning of the present century, before the improvements in bobbin-net machinery were made, the principal scene of lace-making in Buckinghamshire was at Hanslope, but it extended fifteen or twenty miles round in every direction. In 1801, out of 1275 inhabitants of Hanslope, no fewer than 800 were engaged in this manufacture. Children were put to 'lace-schools' at or soon after five years of age. At eleven or twelve years of age they were able to earn enough for their own subsistence. Both girls and boys were taught to make lace, and even men were employed on it: it was often a good resource to men out of their usual employments, for they could earn as much at it as the generality of day-labourers. At the period of which we speak the lace made at Hanslope varied in value from sixpence to two guineas per yard.

The lace made in Bedfordshire was, for some reason or other, not of so fine a quality as that produced in some parts of Buckinghamshire; and the straw-platting, which has been carried on to a greater extent in Bedfordshire than in other counties, was generally more profitable.

British pillow-lace appears to have been at its height from 1800 to 1812. There were some very striking improvements made in the patterns about the former period, which led to a greatly increased demand, and British lace veils sold for from twenty to one hundred guineas each. About 1812, however, the competition of the bobbin-net manufacture began to be felt in earnest, and from that period pillow-lace making dwindled down to a very low ebb. Fashion may perhaps give it a temporary revival, but it is doubtful whether ever again it will be in a prosperous state.

Without professing to give a minute account of the mode of producing Brussels lace, or the kind similar to it, we may convey a few general notions respecting it. It is a light tissue or fabric made from single threads, the openings or meshes between them being formed by twisting the threads round pins. The work-bench, if we may use the term, is generally an oval plate, stuffed and covered so as to form a cushion or 'pillow;' and this is placed either on a table or on the lap. On this pillow a stiff piece of parchment is placed, and holes are pricked through the parchment in any desired form. Through these holes pins are stuck into the pillow. The threads with which the lace is formed are wound upon small bobbins; and from these bobbins the threads are woven around the pins, and twisted round each other in various ways, so as to form a pattern. The formation of the meshes may be described thus:—Suppose a number of ropes to be laid parallel, each consisting of two or three threads twisted round each other, but at every two or three spiral turns the threads composing one rope are twisted around those of its neighbour, and then return to be twisted with its own; this, being done with the whole of the threads, forms the meshwork or ground of the whole piece. The shape or figure of the meshes depends upon the number of turns which are made before the threads of one rope are twisted round those of the adjoining one. In the making of lace these various twistings are effected either by twisting the threads round the pins, or twisting the bobbins round each other. What we have been here describing is the mode by which the meshes or plain groundwork are produced. The lace is, however, ornamented by a thread, much thicker than that forming the net, which is woven or knitted in among the meshes in the form of flowers and other tasteful designs. The value of the lace principally depends on the elegance and completeness of these worked devices.

These are the outlines of all the methods; but the minutiæ were and are different in different places. It is believed that the first ever made in England was that denominated *Brussels point*, of which the network or ground is made by the pillow and bobbins, and the pattern and sprigs worked with the needle. The distinguishing features of the principal foreign laces are said by Mr. Slater (M'Culloch's 'Dict.') to be as follows:—*Brussels ground:* an hexagonal or six-sided mesh formed by platting and twisting four threads of flax to a perpendicular line of mesh. *Brussels wire-ground:* this is made of silk; the meshes are partly straight and partly arched, and the pattern is worked separately by the needle. *Mechlin:* an hexagonal mesh formed of three flax threads twisted and platted to a perpendicular line; the pattern is worked in the net. *Valenciennes:* the mesh is an irregular hexagon formed of two threads, partly twisted and platted at the top of the mesh; the pattern is, as in the Mechlin lace, worked in the net. *Lisle:* this has a diamond-shaped mesh, formed of two threads platted to a perpendicular line. *Alençon:* an hexagonal mesh of two threads, twisted like the generality of Buckingham lace, and considered inferior to most of the preceding. *Alençon point:* formed of two threads to a perpendicular line, with octagonal and square meshes alternately.

Our former article on bobbin-net contains as much information as it may be necessary to give respecting the rise and present state of that branch of industry. We may, however, say a few words as to the mode of manufacture. In weaving plain materials, such as calico, the rows of weft-thread cross the rows of warp-thread at right angles, interlacing one among another in a regular manner, the cross-thread passing over one and under the next of the long threads; in *twilled* materials the cross-thread (or weft) passes over one, and under two, three, or four of the warp-threads, thus giving a kind of ribbed appearance. But in making bobbin-net the adjoining threads are made to twist round each other by the intervention of *two* weft or cross threads. The machine by which this twisting and interlacing are effected is one of the most beautiful pieces of mechanism that the cotton-manufacture presents, but it is too elaborate to be described here. We may, however, show the principle on which the meshes are formed, by the aid of the following cuts.

Fig. 1 represents what would result if the perpendicular threads were of inflexible wire; and *Fig.* 2 the effect produced when they are, as in practice, of flexible fibres. In each case the perpendicular threads, which indeed form the *warp*, may be traced from top to bottom. One of the weft-threads descends diagonally from right to left, and then, after forming a *selvage* or edge, descends from left to right; while at the same time the other weft-thread descends diagonally first from left to right, and afterwards from right to left. The weft-threads twist round the warp-threads at the sides of every mesh, and cross each other at the top and bottom of every mesh.

The net produced by machinery obtains different names, according to the mode in which it is made. There were some years ago *two-plain net*, *square or tuck-notted net*, *fish-mesh net*, *platted net*, &c.; but at present the kinds produced in England are *point-net*, *warp-net*, and *bobbin-net;* these names are derived, not from their peculiarity either in appearance or in use, but from the sort of machines with which they are made. The *quillings*, or

narrow strips of net, are made in broad sheets or widths, being connected together merely by a single thread, which is afterwards drawn out. The meshes in machine-made net vary from about twenty to thirty-six in an inch. The French are accustomed to make a kind of silk net called *single press point:* when this is plain it is called *tulle*, and when ornamented *dentelle*.

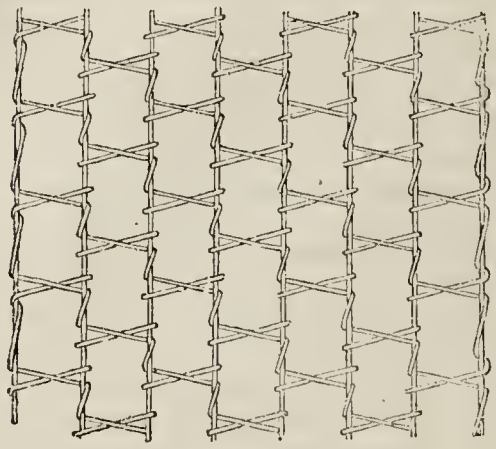

Fig. 1.

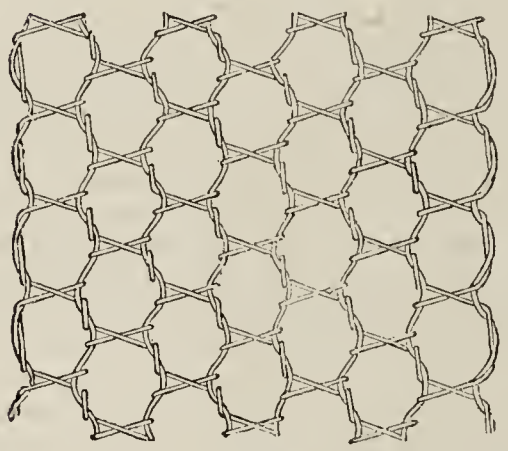

Fig. 2.

THE TURQUOISE.

Tubal.—One of them showed me a ring, that he had of your daughter for a monkey.

Shylock.—Out upon her! Thou torturest me, Tubal: it was my turquoise; I had it of Leah, when I was a bachelor: I would not have given it for a wilderness of monkeys.

Merchant of Venice, Act iii., Scene 1.

In a note on the above passage in the Pictorial edition of Shakspere, it is remarked that "the turquoise, turkise, or turkey-stone, was supposed to have a marvellous property, thus described in Fenton's 'Secret Wonders of Nature,' 1569:—'The turkeys doth move when there is any peril prepared to him that weareth it.' Ben Jonson and Drayton refer to the same superstition."

This gem, the turquoise, is as remarkable for the uncertainty long felt concerning its history, as for the superstition above alluded to. It possesses a beautiful blue or greenish-blue colour, and a texture susceptible of receiving a high polish; it has been ranked as a precious stone from an early period, but much discussion has arisen concerning its origin and nature. De Boodt and Dr. Woodward considered the *callaïs* of Pliny to be the turquoise; and Woodward further supposed it to be nothing else but fossil ivory tinged with copper. But there have been long known two different kinds of the turquoise, one called turquoise of the *old rock*, and the other turquoise of the *new rock*. A distinction has also been known between *oriental* and *occidental* turquoises.

Very contradictory accounts of these different kinds used to be given: some writers said that the "old and new" rocks were two mountains in Persia, from whence the gems were procured; while others said that the term "old" related to a Persian mine, and the term "new" to mines in France, and other places of western Europe; and that this distinction was equivalent to that of "oriental" and "occidental." Tavernier gave some account of the Persian mines in 1681; Reaumur described those of France in 1715; and Dr. Mortimer published a paper on the subject generally, in the 'Philosophical Transactions' for 1746. But still there was a great deal of doubt enveloping the subject; for while some authors spoke of the turquoise as being a fossil bone or tooth of some extinct animal, others were equally certain that it was a proper mineral body, totally unconnected with anything having possessed animal life.

It was not until the present century that the matter was placed on its right basis. Some distinguished mineralogists, particularly Professor Fischer of Russia, analyzed various specimens; and the result arrived at was, that there are two substances to which the name of turquoise is attached, the one of animal origin, and the other a mineral: that the *new rock* or *occidental* turquoise was of the former class, and was to be procured in various parts of France, Switzerland, Bohemia, and Siberia; while the *old rock* or *oriental* turquoise was a true mineral, brought from Nishapore in Persia; that the latter was the *Calaïte* of Pliny, and is to be considered as the true turquoise, which has been supplied from Persia from a remote period.

Fischer published, in 1816, an 'Essai sur la Turquoise,' in which he minutely describes these two kinds of turquoise. The true gem is an argillaceous substance, coloured principally by oxide of copper, and occurs sometimes in rounded masses, at others in layers, and at others in veins. When broken it has a lustre something resembling that of wax, but is susceptible of receiving a high polish; it is an opaque gem, being only slightly translucent near the sharp edges; in hardness it is a little inferior to quartz; and in weight, or specific gravity, about three times as great as water; about three-fourths of its whole weight consist of argil, the remainder consisting of oxides of copper and of iron, and water. Fischer has distinguished it into three species, the *Calaïte proper*, the *Agaphite*, and the *Johnite*, according to certain mineralogical differences. The 'oriental' turquoise is worn as a gem in diadems, bracelets, &c.; and also, particularly among the Persians, as decorations for the handles of knives, the hilts of swords, &c.: it also constitutes one of the amulets or talismans of the Asiatics. Fischer speaks of a noble turquoise in the collection of M. Weyer, a jeweller of Moscow; it consists of a thin plate of an exquisite colour, attached to the matrix or bed in connection with which it was originally found, and shaped into the form of a heart. It is said to have been once a talisman belonging to Nadir Shah of Persia, and to contain a verse of the Koran beautifully engraved on the surface: it was purchased at Mushed in Khorasan, and M. Weyer demanded five thousand roubles for it. (A Russian rouble is worth about 3*s.* 3*d.* English.)

The inferior, 'new rock' or 'occidental' turquoise, called also the turquoise odontolithe, is, as has been said, a fossil production. It is a disputed question whether these turquoises are in every case the *teeth* of an animal, or whether any other portion of the skeleton has been so designated. Bone is susceptible of being penetrated by metallic oxides, which will impart colour to it; but it seems probable that the teeth alone possess that degree of hardness necessary for them to pass as gems. Swedenborg has given a representation of a whole skeleton of a quadruped, which had become coloured by oxide of copper; but for the reason just stated, Fischer concludes that it is the teeth only which are known as turquoises. A specimen, analyzed by Bouillon-Lagrange, consisted of phosphates of lime, of iron, and of magnesia, and carbonate of lime, the phosphate of lime amounting to four-fifths of the whole weight. Nothing satisfactory is known as to what kind of animal these teeth once belonged: the *mastodon* of Cuvier is mentioned as the most

probable. These fossil teeth, whatever may be their nature, are found principally near the town of Simore in Lower Languedoc, and were first made known in 1628 by Guy la Brosse; and from Reaumur's account it would seem that they are not found in the blue state, but are made so by heat. "Our turquoises are naturally whitish or yellowish, of a colour something like that of our building stones; but if they are exposed for some time to the action of fire, far from becoming whiter, they take a blue colour." This seems to be supported by an experiment of Professor John at Moscow, in which he converted the tooth of a mammoth into a kind of turquoise by means of a blow-pipe.

It thus appears that the only kind of turquoise which can rightly be called a gem is the true mineral brought from Persia; and this is further borne out by the fact that the very finest tooth-turquoises will not bring half the price of the mineral turquoise: it may indeed in some degree be considered as an artificial substitute for the true gem. We shall now, therefore, dismiss this substitute, and pay a visit to the turquoise mines of Khorasan. Very few Europeans, at least such as are capable of accurately describing what they have seen, have visited that country. Professor Agaphi of Moscow visited the mines during an overland journey from India to Russia in the early part of the present century, but by far the fullest description of them has been given by Mr. Baillie Fraser, who visited Khorasan in 1821.

Khorasan is situated at the south-east of the Caspian Sea, a sandy desert separating it on the north from Khiva, of which we have recently treated, and the scene of some recent operations on the part of the Russians. In a mountainous district, situated about forty miles westward of the town of Nishapore, are the turquoise mines. Only one of the hills has yet been found to contain turquoises, and near it have been built two villages, inhabited by the miners, and called respectively *old Madan* and *new Madan*, "madan" being the Persian word for a "mine." There are six mines in the hill: 1st, the Khooroosh mine; 2nd, the Madan-e-siah, or black mine; 3rd, the Anbee mine; 4th, the Cummeree mine; 5th, the Abdool Kezakee mine; 6th, the Kaur-e-suffeed, or white cavern.

The first mine is not very productive of fine gems. There is a bed of light grey porphyritic earth, which is turned over and over by the miners; and bits of the turquoise are found attached to fragments of porphyritic rock. The second mine consists of porphyritic rock deeply tinged with iron, and having little veins of the blue turquoise matter pervading it in every direction, but chiefly between the laminæ of the rock. Several small pieces of the gem are seen adhering to the rock; and in some places the turquoise matter seems to have bubbled out from the rock in the form of little pimples of an exquisite colour. The third mine is now unworked, although it appeared to Mr. Fraser that there was still abundance of turquoise matter contained in it. A white saline efflorescence, said by the natives to be alum, was seen covering a part of the face of the rock of this mine. The fourth mine consists principally of two deep excavations in a solid dark-brown rock, through which the turquoise matter is disseminated in small veins: one of these pits had stopped working on account of having filled with water; for the miners appear to be ignorant of the means of obviating that difficulty. The fifth mine, which is the principal of the group, is situated near the summit of the hill: here, as in the former cases, turquoise matter pervades a porphyritic rock; but it is also found, in an imperfect state, in a yellow ochreous clay. In this mine the turquoise occurs in all the various forms which it presents, viz., in tolerably symmetrical nodules of different sizes; in narrow veins pervading the rock; and in irregular masses, generally of inferior quality. The sixth mine is now very little worked, probably on account of the comparative exhaustion of its valuable contents.

The mines are worked in an exceedingly slovenly manner, without any order or regularity. No shafts, chambers, or galleries are formed; but the men dig just where they think the rock is richest, and leave the rubbish where it was, blocking and encumbering the way. Sometimes, with picks and hammers, they knock away large pieces of the rock, get out the turquoise how they can, and leave the débris strewed about. No system is laid down by which the gem can be best extracted from the rock, but each man is left to adopt his own plan. If an excavation gets choked up with rubbish, they leave it, and go to another spot; and if it gets filled with water, they in like manner abandon it.

This wretched system, or rather want of system, is one of the results of the Persian mode of government, which is so defective, that, according to Mr. Fraser, the constant Persian practice is, "Every one lives for himself, and snatches what he can." The mines are the property of the crown, and are farmed out to any one who will give the price demanded: this demand seems to depend generally on the exigencies of the sovereign. The sum demanded for the year 1821 was stated by Mr. Fraser at about 2700*l.* English. Although the mines are offered for open competition, yet the inhabitants of the two villages of which we have spoken have so many more facilities than others possess, that competition against them is useless, and the villagers remain the farmers as well as the labourers of the mine. The villages contain about a thousand persons, of whom two hundred are men in the prime of life; and the mode of working is this: one hundred villagers take the whole mines at a price agreed on, and work together in parties of five or ten, who divide the produce of their labour either collectively or by these separate parties, each contributing his share of the rent of the mines. The produce is then sold to merchants who resort there at stated periods, or it is sent for sale to Mushed, the principal town in the neighbourhood.

The turquoise is sold by the miners in three different states: 1st, single stones, freed from the parent rock, and ground so far as to expose the size, shape, and colour; and the merchant and the miner come to a bargain according to its excellence in these particulars. 2nd, Stones freed from the principal part of the parent rock, but not all; and the purchase of such is a kind of lottery, for it is only here and there that the merchant can see the quality of the stone imbedded in the pieces of rock. 3rd, Masses, in which the parent rock is but loosely knocked off, so that it is still more a chance what may be the quality of the turquoises within: a mass of such stones is sold by weight.

Most of the produce is carried to Mushed, where many stone-cutters reside: there are several caravanserais wholly occupied by dealers in the gems, who employ artisans to work them into various forms. The mode of working is this:—a wheel covered with gum-lac and sand, mixed while the first is in a state of fusion, from a quarter to one-third of an inch thick, is turned rapidly by a bow and string fitted to its axle; a broad hoop of thin wood fixed, but concentric with this wheel, retains the spatterings of sand and water thrown off in its rapid revolutions; the whole is fixed to a board, which may be moved at pleasure, and behind it sits the workman, who gives the degree of polish required by using wheels of different fineness: the gem is held in the hand, and ground and polished on the surfaces of the wheels.

The gems, which are mostly worked up into the form of rings, are then sorted, and conveyed to different countries. The finest qualities generally find their way to India, by way of Herat and Candahar. The next are conveyed westward to Persia and Turkey; or else go to Bokhara, where they are sold to merchants trading to Russia, by which they gradually find their way to Europe. The less perfect, considered as mere gems, sell for a much lower price, on account of their being frequently covered

with small white specks; but with the Arabs this is no disadvantage, for they value the turquoise chiefly for its reputed talismanic qualities; and they seek for large pieces, without particular reference to purity of colour. The stones intended for amulets are usually set in small rings of plated tin.

FOREIGN SCHOOLS OF DESIGN.

The establishment of Schools of Design in this country may, in the progress of time, so materially increase our commercial prosperity, and so improve and elevate our national taste, that it is of importance to know, with some degree of accuracy, the principles, and to be tolerably well acquainted with the practice, that can best develope the capabilities of such institutions. To acquire the requisite information, Government has, within the last two or three years, caused personal inquiries to be made into the state of such schools on the Continent, from whence the idea of our own at Somerset House was borrowed. The result is the Report now lying before us.*

In Prussia, it appears the Schools of Design form a portion of the general system of art-education, that again being intertwined with the grand scheme of national education. The schools for art-education are divided into three classes:—1, elementary; 2, schools for artisans; and 3, academical in the schools of fine art. Under the words 'fine art' every species of decorative design, whether for manufacture, or for the loftier purposes of poetry, painting, &c., is included; and consequently, the only difference observable in the education of the individuals intended for these branches, consists in the less or greater extent to which that education is carried. In accordance with this principle, the Royal Academy of Berlin includes within its classes students of both kinds, whom it considers alike artists. All the inferior schools in Prussia for art-education may be said to radiate from this Academy as from a common centre, for all they teach is but the amplification of the studies of its classes. In Bavaria there is no separate system of art-education, no separate school of design, but in every portion of that system provision is made for the cultivation of artistical taste and skill; and with reference not only to the future pursuit of the individual, but also to the particular branches of industry for which artistical designers may be required in any particular locality. In France, art-education, although very extensively diffused, appears to be under no central superintendence; neither does it appear to be combined into any organised system; but its schools are numerous, and some of them are so admirably managed as to present altogether the nearest approximation to those which appear the most suitable for our own country. We may particularly mention that of Lyons. This is a school of fine art, with the study of designs for the staple manufacture of the town, silk, attached; and to promote the prosperity of this manufacture is evidently the chief object of the school—for of the annual cost, 28,500 francs, no less than 25,480 are paid by the town of Lyons, and only 3100 by the government. In the choice of pupils also, it is observable that the preference is always given to the children of merchants and manufacturers, who are destined to the manufacture of silk. Therefore, although all students who enter the school pursue studies calculated to make them artists in the higher sense of the word, it is evident that the object sought by this arrangement is to produce first-rate designers for industry. The pupils commence by making outlines, first, of parts separately, and then, as they advance, of the whole human figure; and it is not until they have completed their exercises, by being able to draw and paint the figure from the antique and living model, that they are called upon to decide whether their future pursuits will be directed towards designs for industry or for fine art. If the former, they then pass through the classes of architecture and ornamental design; then the classes of loom manufacture and of the painting of flowers from copies and from nature. In the study of designs for silk, one year is occupied in connection with ancient ornament, arabesques, &c., accompanied by exercises in designing original compositions. The flower-painting class lasts two years, and the class of the theory of manufacture an indefinite period. In this school there is comprised:—

"1st, The general study of design.

"2nd, The study of the process and reproductive capabilities of the manufacture to which design is to be applied; and

"3rd, The study of the particular species of art rendered necessary by the conditions which these impose upon the artist."

If to such a school as that here described we suppose the study of manufactures *generally* (with preference, of course, to those which are of the greatest importance to us) to be attached, we shall in all probability have before us the best model for the construction of our own School of Design at Somerset House, and of the numerous branches which it is to be hoped will spread from it through every part of the country. It may be thought that much more than is requisite is here provided for the education of the industrial artist, and that the consequence must be the production of a great number of mediocre painters, sculptors, &c. But there are various checks in the way. The profits of a skilful designer of manufacture in France are greater than those of a second-rate artist, and his talent is highly esteemed. As Mr. Dyce also justly observes:—"Were the capability of drawing the human figure as common as that of reading and writing (which, in France, it may be said to be), we should no more than the French do think of identifying the former with the genius necessary for the practice of fine art, than we should suppose the latter must inevitably lead to deluge the world with poetry." On the other hand, as to the benefits derived from so liberally educating the industrial artists, it is sufficient to point to the great and highly favourable influence exercised by them in France over all the branches of manufacture with which they are connected, and, through them, over the national taste. In Lyons, the commercial value of that (in England) very uncommercial article Taste is so high, that a house will take a young man who exhibits more than ordinary powers into partnership, in order to monopolise his services; and so entire is the confidence reposed by the French manufacturer in his designer, that he frequently does not see the patterns till they appear in the silk. With us, at present, there is little or no estimation of such abilities, and consequently no sufficient opportunities offered for its production. Yet, in spite of this, at least as much is spent in connection with patterns by English manufacturers as by French; "the difference is, that the money which in France is paid directly to the artist, is in England frittered away on expedients for superseding the employment of original designers; expedients which, if law and honesty are to be taken into account, cannot be reckoned other than illegitimate, and which, if prudent, must, I fear, be thought very short-sighted, because the great bulk of patterns executed in England according to the present system must inevitably want the stamp of novelty and originality, which is not only the great characteristic of the French, but is really the advantage which the French manufacturer gains by paying liberally for the assistance and judgment of highly educated artists."*

Besides the class of designers whom it is the especial object of the schools in question to produce, it ought to endeavour to diffuse some degree of artistical knowledge

* 'Report made to the Rt. Hon. C. Poulett Thomson, M.P., &c., President of the Board of Trade, on Foreign Schools of Design for Manufactures,' by William Dyce, Esq.

* 'Report,' p. 35.

among the very numerous bodies of workmen engaged in labours requiring a certain amount of taste. In the foreign schools this is done on an admirable principle, which, whilst it inculcates the necessity of educating designers as if they were to become workmen, educates workmen as if they were to become designers. The incapacity of English workmen is severely felt in the execution of coloured fabrics. It is a common custom to vary patterns extensively by altering the arrangement and quality of the colours. This, evidently, an artist alone can do with propriety; but not only are artists never employed, but the manufacturer, to whom nominally belongs the superintendence of this delicate point, leaves it to ignorant workmen, who, having no independent mode of thought upon such subjects, follow an established rule, however opposed to good taste the results may be. "A few years ago, a French manufacturer of paper-hangings came to this country with the intention of commencing business. To ensure his success, he brought with him a skilful designer of patterns, believing that, with the advantages he should enjoy in other respects, he had only to superadd the quality of excellent design (in which English papers are lamentably deficient) to drive all competitors out of the market. He engaged English workmen, and commenced operations. His designer, accustomed to the French method, was of course not content with having merely finished the pattern; he considered that half of his vocation consisted in seeing that no injury was done to the character of his designs through the unskilfulness of the workmen: with this view, he insisted that the tints employed should exactly correspond to those of his design; and that, if the colouring were to be changed, the alteration should be according to his judgment. Could anything be more reasonable? But what was the result? The workmen struck work: they had been accustomed to make up their tints in large quantities; they had never used but three greens, or two reds, or two yellows, and so on; there were only certain changes in the arrangements of the colours which they were in the habit of making, and it was absurd to suppose that they should submit to the caprice of a Frenchman, who seemed to think there were as many colours as days in the year, and who insisted upon many minute variations of tint, of which they could see no use, and which were not employed in the trade. The concern was accordingly broken up."* This very manufacture of paper-hangings shows strikingly the injury resulting to our commercial prosperity from the want of artistical designers. Half a century ago, France was supplied with paper from England to a large amount, and the names of the artists who then gave the manufacture its high reputation have been preserved. Now France receives little or nothing of this kind from us, whilst we are indebted to that country for whatever novelty or beauty of design the paper in the shops of the metropolis exhibit.

With respect to our own School of Design, the Report considers it indispensable that, with the study of design generally, two at least of our principal articles of industry, the silk manufacture and the calico-printing, should be taught practically; and in teaching these, other branches of industry are in effect taught at the same time, for those two are the types of every species of weaving and printing. Instead of commencing with the human figure, it is advised that the study of ornament, flowers, &c. should have the priority, in order that those individuals whose pursuits really would be but very slightly benefited by a knowledge of the former, might not be compelled to study it. In this case, however, it would be necessary, in order to preserve the school for its chief object—the production of industrial designers—to make the previous study of ornament an indispensable condition of admission into the classes of the human figure. At the opening of the school at Somerset House, it was proposed that the qualification for admission should be considerable proficiency in drawing. This Mr. Dyce thinks inexpedient, as there are at present no elementary schools of design to prepare pupils for a higher stage. We conclude with the following observations from the Report, which appear to us as important as true. "We shall take a very narrow view of the operation of the foreign schools, if we suppose their influence on manufacture to be due solely to that part of their organization which has an immediate bearing on industry; or that by making the Government school more perfect in that respect than the continental establishments, any approach to the amount of good effected by the latter will be made, without the same liberal employment of the collateral aids of elementary instruction, and other means of cultivating popular taste. In matters of taste, it is no otherwise than in commerce, the production must always depend upon and bear an exact proportion to the consumption; it is therefore not less necessary to create the demand for tasteful design in industry than it is to provide for its exercise. The more expensive articles of commerce will always find purchasers, so long as wealth and its concomitant advantages of education and cultivated taste exist; but it is not among the wealthy, or in the more costly productions of industry, but among the less opulent classes of the community, and in the every-day supplies and consumption of the market, that the real character of national taste is discernible; and the standard of this, as it appears to me, can only be raised by informing the minds of those who are to become the purchasers, as well as cultivating the talent of those who are to supply the things purchased. Every one admits that the great evidence which we find in France of the knowledge and love of art in the cheaper kinds of manufacture is due to the ample opportunities of study provided for the common people."

* 'Report.'

THE MUSQUASH, OR MUSK-RAT.

Musquash, the Cree name for the *Fiber Zibethicus* of Cuvier (*Ondatra* of Lacépède), is a genus belonging to the family *Castoridæ*.

In a tract which has for its title 'A Perfect Description of Virginia,' 1649, we find among the "Beasts great and small," "Muske Rat, so called for his great sweetnesse and shape."

The head is short. Body thick and rather flat; legs very short; hind-feet large, not webbed.* Dark umber brown above; sides, anterior part of belly, middle of breast, lateral part of neck and cheeks, shining yellowish-brown; chin, throat sides of the chest, and posterior part of the abdomen, ash-grey; tail compressed, convex on the sides, with its acute edges in a vertical plane, covered with a thin sleek coat of short hairs, which allow a number of small roundish scales, well separated from each other, and which, as well as the hair, are dusky-brown, to appear through them; acute margins of the tail (which is rather thicker in the middle than at the root, and tapers gradually from its middle to its extremity, which is not acute) covered with a close line of longer hairs dark brown on the upper edge and soiled white on the under one. Length of head and body, 14 inches; of the tail, 8 inches 6 lines.

The fur, which much resembles that of the *Beaver*, but is shorter, resists the water during the life of the animal, but is easily wetted immediately after death.

Charlevoix states that the Musk-Rat takes the field in March, at which time its food consists of bits of wood, which it peels before it eats them. After the dissolving of the snows, he says that it lives upon the roots of nettles, and afterwards on the stalks and leaves of that plant. In summer it feeds on strawberries, &c., to which succeed

* Hearne erroneously says that the hind-feet are webbed.

the autumnal fruits. During this time, he states that the male and female are rarely seen asunder. According to the same author, they separate in winter, when each takes up its lodgings apart, in some hole or in the hollow of a tree, without any provision; and the Indians declared that not the least morsel of anything is eaten by them whilst the cold continues. "They likewise," adds Charlevoix, "build cabins nearly in the form of those of the beavers, but far from being so well executed. As to their place of abode, it is always by the water-side, so that they have no need to build causeways. . . The flesh is tolerably good eating, except in the time of rut, at which season it is impossible to cure it of a relish of musk, which is far from being as agreeable to taste as it is to the scent."

Dr. Richardson (*Fauna Boreali-Americana*), from whom the abridged description is taken, and to whose details we refer the reader, states that the Musquashes vary considerably in size, and that though they have a strong musky smell, particularly the males, in spring, their flesh, which somewhat resembles flabby pork, is eaten by the Indians, who prize it for a time when it is fat, but soon tire of it. They have, according to this author, three litters in the course of the summer, producing from three to seven at a litter, in 55° N. lat., and begin to breed before they attain their full growth. Great numbers are destroyed by the inundations which cover the low grounds where they haunt, and in severe winters they are almost extirpated from some localities by the freezing of the swamps inhabited by them. Famine in such cases drives them to destroy each other. A great mortality, the cause of which is unknown, also sweeps them away, and the deaths at such periods (which are uncertain) are so numerous, that a fur-post, where the *Musquash* is the principal return, is not unfrequently abandoned till the fecundity of the animal has repaired, which it does in a very few years, the ravages of disease.

Dr. Richardson places the southern limit of the *Musquash* about 30° N. lat. According to Bartram they are found in the north of Georgia and Florida, and Dr. Richardson ascertained that they extended northwards to the mouth of the Mackenzie, 60° N. lat. Small grassy lakes or swamps, or the grassy borders of sluggish streams with muddy bottoms, are favourite haunts, and there they feed chiefly on vegetables. In the northern districts the roots and shoots of the bulrush and reed-mace, and the leaves of various carices and aquatic grasses, form their staple. Pennant states that they are very fond of the Sweet-flag (*Acorus Calamus*), which, according to Dr. Richardson, does not grow to the northward of Lake Winnipeg. The last-named author often saw small collections of fresh-water mussel-shells (*Unio*), on the animals of which they are said to feed, and which, he was informed, had been left by him.

The habitations of the musquashes and the mode of hunting them are thus described by the Doctor:—"In the autumn, before the shallow lakes and swamps freeze over, the musquash builds its house of mud, giving it a conical form, and a sufficient base to raise the chamber above the water. The chosen spot is generally amongst long grass, which is incorporated with the walls of the house, from the mud being deposited amongst it, but the animal does not appear to make any kind of composition or mortar by tempering the mud and grass together. There is however a dry bed of grass deposited in the chamber. The entrance is under water. When ice forms over the surface of the swamp, the musquash makes breathing-holes through it, and protects them from the frost by a covering of mud. In severe winters however these holes freeze up in spite of their coverings, and many of the animals die. It is to be remarked that the small grassy lakes selected by the musquash for its residence are never so firmly frozen nor covered with such thick ice as deeper and clearer water. The Indians kill these animals by spearing them through the walls of their houses, making their approach with great caution, for the musquashes take to the water when alarmed by a sound on the ice. An experienced hunter is so well acquainted with the direction of the chamber and the position in which its inmates lie, that he can transfix four or five at a time. As soon as, from the motion of the spear, it is evident that the animal is struck, the house is broken down, and it is taken out. The principal seasons for taking the musquash are, the autumn, before the snow falls, and the spring, after it has disappeared, but while the ice is still entire. In the winter time the depth of snow prevents the houses and breathing-holes from being seen. One of the first operations of the hunter is to stop all the holes, with the exception of one, at which he stations himself to spear the animals that have escaped being struck in their houses and come hither to breathe. In the summer the musquash burrows in the banks of the lakes, making branched canals many yards in extent, and forming its nest in a chamber at the extremity, in which the young are brought forth. When its house is attacked in the autumn, it retreats to these passages, but in the spring they are frozen up. The musquash is a watchful but not a very shy animal. It will come very near to a boat or canoe, but dives instantly on perceiving the flash of a gun. It may be frequently seen sitting on the shores of small muddy islands in a rounded form, and not easily to be distinguished from a piece of earth, until, on the approach of danger, it suddenly plunges into the water. In the act of diving, when surprised, it gives a smart blow to the water with its tail."

Varieties.—Dr. Richardson records three varieties besides that above described.

1. The *Black Musquash*, rare.
2. The *Pied Musquash*, with dark blackish-brown patches on a white ground.
3. The *White Musquash* (*Fiber Zibethicus-albus*, Sabine). This albino is not unfrequent. Dr. Richardson saw several.

According to Hearne, the musquash is easily tamed, soon becomes attached, and is cleanly and playful.

The fur is used in hat-making, and there is, according to Dr. Richardson, an annual importation of between four and five hundred thousand into Great Britain from North America for that manufacture. Charlevoix also notices the employment of the fur in the hat-trade.

[The Musquash.]

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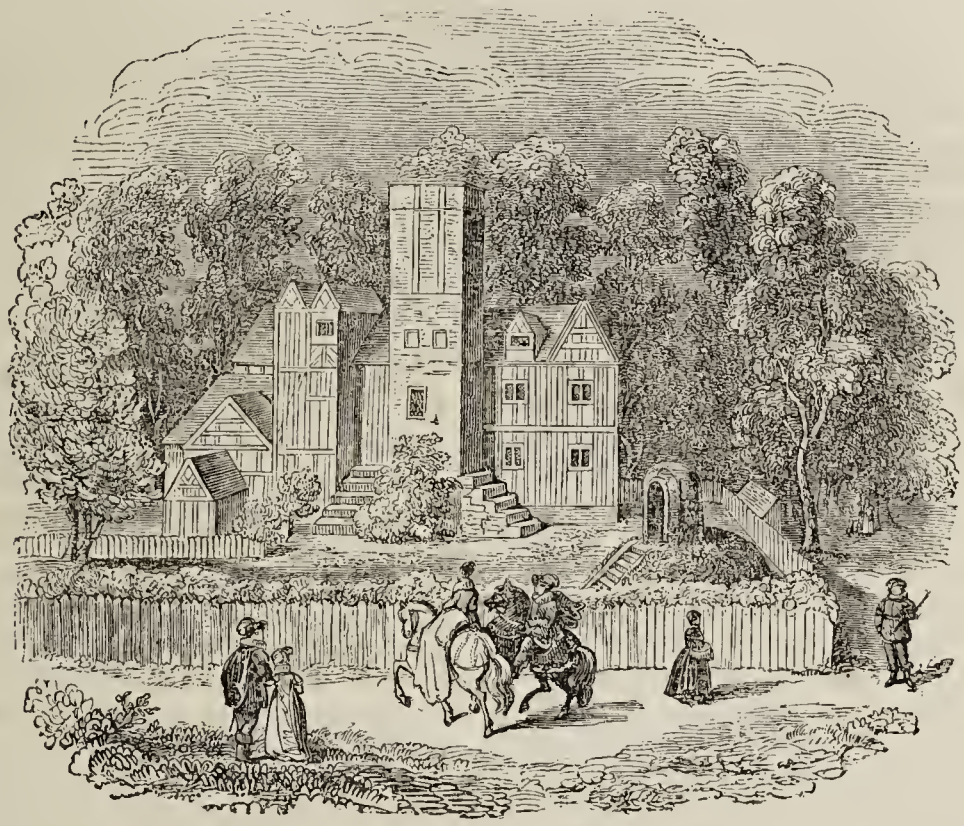
CHARLES II. AT BOSCOBEL HOUSE.



[Boscobel House.]

Boscobel House, situated in the parish of Donnington in Shropshire, is identified with an event in English history which has become better known and has struck deeper into the popular mind than almost any other, if we except perhaps the Gunpowder Plot. By supposing for a moment the most stirring political question of the present day invested with a tenfold interest, we shall scarcely form an adequate idea of the powerful feelings which entered into the contests that divided the country into two hostile parties in the reign of Charles I. The excited state of England between thirty and forty years ago, when an invasion was anticipated, may be compared to the times of Charles I., though wanting the interest and variety of incidents by which they were characterised. At one period Boscobel was the resort of Royalist pilgrims, and the loyalty of many a gallant cavalier has been warmed by the historical recollections associated with the place. These events we shall briefly detail.

After the execution of Charles I. in January, 1649, his eldest son, then about twenty years of age, who was then at the Hague, took the title of Charles II., and in June, 1650, he landed in Scotland, for the purpose of fighting his way to the throne. He was crowned at Scone on the 1st of January, 1651, and, marching into England with an army which he had collected, was proclaimed king at Carlisle. The young king received little encouragement on his route from the gentry of his own party, whom Cromwell's vigorous system had sufficiently overawed; and the spirit of the Royalist army was not animated with that ardent loyalty and devotion which braves every discouragement and grows warmer in adversity: its discipline was also in a neglected state. Charles was therefore in reality but ill prepared to meet his redoubtable opponent, and at Worcester, where the Royalist army had taken up their quarters, Cromwell, whose coming they had foreseen, but never provided against, rushed into the city as to a prey. He commanded his troops to fall on in all places at once, seeming to think it needless, against so ill-ordered an enemy, to trouble himself by delay or circumspection. On the king's side all was confusion—there were few to command, none to obey; and so sudden and complete was the route, that Charles was compelled to join in the flight, lest he should be borne down by his own friends.

The following account of what afterwards befel Charles is principally taken from the story which Lord Clarendon says that he heard from the king's own lips:—The king remained until night with General Lesley and about 4000 horse which had kept together in their retreat; but foreseeing the difficulty that there would be in marching this ill-disciplined army back into Scotland, he left it at night with two of his servants, whom he dismissed at day-break, after he had made them cut off his hair. Charles then concealed himself in a wood on the borders of Staffordshire, called Boscobel, where he lay down and slept soundly. When he roused himself, there came to him a gentleman of the name of Careless, who had also fled from the king's army, and had concealed himself in an oak near the spot where Charles had been sleeping. By this gentleman's advice and help, the king climbed into the oak, and then helped his companion to mount after him. They remained in that tree the whole day, during which they saw many persons who were searching for the king, and talked, in his hearing, of how they would use him if they could take him.

During the whole of this day the king was without food, of which he had scarcely eaten any the day of Cromwell's attack, and it was two nights since he had taken any rest, excepting his short sleep in the wood. At nightfall, therefore, he and Captain Careless came down

from the tree, and went to the cottage of a poor man, who took the king to a little barn full of hay. Careless now left him, and Charles fell soundly asleep until the poor man brought him some bread and buttermilk, which he thought the best food he had ever eaten. Here he remained two days and two nights, his only food being bread and buttermilk. On the third night the king, under the leading of a strange guide sent by Careless, set out for another cottage twelve miles off, having changed his clothes, even to the shirt, for those his poor landlord was wearing. This dress is thus described in a scarce tract of that period: "He had on a white steeple-crowned hat, without any other lining besides grease, both sides of the brim so doubled up with handling that they looked like two waterspouts; a leather doublet, full of holes and almost black with grease about the sleeves, collar, and waist; an old green woodriff* coat, threadbare and patched in most places, with a pair of breeches of the same cloth, and in the same condition, the slops hanging down to the middle of the leg; hose and shoes of different parishes; the hose were grey stirrups, much darned and clouted, especially about the knees, under which he had a pair of flannel stockings of his own, the tops of them cut off; his shoes had been cobbled, being pieced both on the soles and seams, and the upper leathers so cut and slashed, to fit them to his feet, that they were quite unfit to befriend him either from the water or dirt." This exotic and deformed dress, added to his short hair cut off by the ears, his face coloured brown with walnut-tree leaves, and a rough, crooked thorn-stick in his hand, had so metamorphosed him, that it was hard even for those who had before been acquainted with his person and conversant with him to have discovered who he was.† In order to avoid the high roads, he and his companion traversed fields and hedges and ditches: the king's shoes pinched him so intolerably, that he threw them off and walked in his stockings, and he was so tired and hurt, that he many times cast himself on the ground, preferring the risk of being taken and suffered to rest, to the purchase of his safety by such misery. Nevertheless he reached the cottage, where again he remained in a barn full of straw.

Thus did the king pass from one poor man's house to another, ill fed, clothed in rags, and miserably lodged, until at length he was conducted by a Catholic priest to the house of Mr. Lane, a magistrate, in Staffordshire. Here he remained in comfort long enough to recover from his fatigue; but a reward had been offered by the parliament to any one who would deliver him up, and it was certain that he could not be secure in England. It was therefore determined that Miss Lane, a daughter of his landlord, should ride behind him on horseback to Bristol, where she should pay a visit to Mrs. Norton, her relation. This journey they effected about the middle of October; they slept each night at the house of some friend, on whose discretion they could rely, and Miss Lane pretended that the king was a neighbour's son, who had been sent to ride with her in order that he might recover from an ague. She called him William, and his supposed illness was a pretext for his going to his chamber as soon as he arrived at the house where he was to lodge for the night. After spending a few days at Mr. Norton's, the king made his way (accompanied by Lord Wilmot, afterwards Earl of Rochester) to the neighbourhood of Lyme, in Dorsetshire, where a ship was hired to convey him to France. On the night, however, fixed for his sailing, the captain was prevented from embarking by the importunities of his wife, and Charles had but just time to escape before the inn was searched for him; suspicion having been excited by a smith, who accidentally examined his horse's feet, and said that he was sure the horse must have travelled far, as his four shoes had been made in four different counties. At last, after wandering through Dorsetshire, Wiltshire, Hampshire, and Sussex, Charles embarked, in the month of November, at Brighton, and reached Fecamp, on the coast of Normandy, in safety.

Nearly ten years elapsed before the Restoration took place; the 29th of May, 1660, being the date of this event. This was also the king's birth-day, and it was long regarded as a festival throughout England, and commemorated by the display of oak branches and sprigs of oak worn in some part of the dress. To this day, in many districts where old customs linger long after they have ceased to be observed in towns, the boys and children of the village wear oak leaves in their hats, and those who do not wear these emblems of the day are pelted with eggs or subjected to some rough usage.

* Woodreeve's, or Woodman's.

† Sir Walter Scott's Illustrations to 'Woodstock.'

SCALES AND WEIGHTS.—I.

The weighing of any quantity of a saleable commodity in a pair of scales is an operation resting on more curious principles than the generality of purchasers suppose. There appears to be nothing very remarkable in putting a piece of brass or iron in one scale, and loading the other with an equivalent weight of the article to be sold; yet have the construction of the scales, and the determination of the size of the brass or iron weights, occupied no small share of the attention of scientific men, and also of the legislature.

In the first place, we have to bear in mind what we mean by the word "weight." Weight is nearly synonymous with *gravity*, that is, it is the force with which a stationary body tends to fall to the earth. We know that substances on the earth's surface have a tendency to press downwards,—by which word we mean, towards the centre of the earth,—and the amount of this pressure increases with the mass or quantity of matter, without regard to bulk. Now we shall find that what we call *weight* is nothing more nor less than this downward pressure: if we hold a brass pound weight on the palm of the hand, the force of gravity tends to carry it downwards, as usual, but the hand is in the way, and the weight cannot descend; it nevertheless shows its power by *pressing* on the palm of the hand, and the amount of that pressure we choose to call by the name of a "pound." Weight is therefore a pressure, resulting from gravity.

It is found that bodies having equal weights are often of unequal bulk; and this is one of the reasons why weighing-scales are necessary. If we take a cubic inch of iron, and a cubic inch of cork, it is found that one is about thirty times the weight of the other, owing to the difference in the amount of porosity or vacant space in the two, whether we can detect this difference by the eye or not: this therefore shows that mere *measuring* will not give us a comparison between the quantity of substance in two bodies; and it has been a custom among most civilised nations, to have certain pieces of metal, not liable to much change of bulk by temperature, &c., which shall constitute *weights*, and that the majority of articles of commerce shall be bought and sold in quantities regulated by those weights as a standard.

Fig. 1.

The next point to determine is, how are we to ascertain that two quantities of different substances have precisely the same weight? If I agree to give five shillings for a pound of tea, how am I to know when the quantity of tea, consisting as it does of small pieces, is as heavy as

the brass pound weight with which it is compared? There are different ways of doing this; but the one that has been found most convenient is by the employment of a lever, and by an observance of a particular property of the lever. If a straight iron bar, of equal thickness throughout, be suspended in the middle by a cord, as in the preceding figure, it will remain perfectly horizontal; for supposing either end to tend downwards, in accordance with gravity, the other end must necessarily be thrust upwards, in opposition to gravity: the two ends therefore counterbalance each other, and the bar remains horizontal. Now it is important to remark, that if equal weights be attached to the two extremities of the bar, they will not disturb its horizontal position, because neither end could descend without the other end ascending in opposition to the force of gravity. Let us suppose, then, that we attach equal weights to the two ends, and let these weights consist each of a shallow pan suspended from the bar by three equal strings, as in *fig.* 2: we have now ob-

Fig. 2.

tained, nearly in form and in principle, a pair of scales: we have been adding to the weight suspended from the cord, but yet we have not disturbed the horizontal position of the bar, simply because we have put equal weights at each end, and at equal distances from the suspending cord. Pursue the subject further, and suppose a piece of metal,—say a brass pound weight,—to be put into the left hand scale; what follows?—Neither end of the bar has lost its natural tendency to sink towards the earth, but so long as the weights on each side of the suspending cord remain equal, the descending tendency of the two ends neutralise each other; but directly an additional pound weight is added to one side, that side obtains a mastery over the other, and it descends, not with its whole weight, but with the excess of its weight over that of the other side. How is the bar now to be brought back to its horizontal position, without removing the preponderating weight? The answer is, by adding to the weight in the other scale until the horizontality is attained; and it must be evident that the quantity so added is precisely equal in weight to the brass pound put into the left hand scale, for by no other means could the total weight on each side of the suspending cord be equal, and unless it were equal, the bar could not be horizontal.

The act of weighing a commodity in a pair of scales consists then in this:—We have a bar so nicely balanced in the middle of its length, that it remains horizontal: we suspend from its two ends pans of such equal weight that they do not disturb the horizontal position of the bar: we place in one pan a piece of metal of a known weight, by which the bar is thrown out of the horizontal position; and we then put such a quantity of the commodity into the other scale, as to restore the bar to its former position; and we rightly infer that the quantity so put in exactly equals in weight the piece of metal placed in the other scale. This piece of metal we therefore call a 'weight,' because it is a representative of the weight of the commodity put into the other scale: it is thus seen that in our commercial dealings we act on this principle, that two quantities which will produce similar effects on the end of a balance lever, we infer to be equal in weight. We say nothing here of the "turn of the scale," or the "tolerance en plus," as the French term it; this is a custom in weighing that has grown up we know not how, but it has nothing to do with the principle of the balance.

Such is the principle of a common pair of scales, and that such an instrument, or one bearing a resemblance to to it, has been in use from very early ages, we have abundance of evidence, both from the Bible and from other sources. Whether a balance with equal arms, or a contrivance similar to the *steel-yard* (of which we shall presently speak), were the earliest known, it would be now difficult to say.

In our illustration of the principle of the balance, we have purposely treated the matter in its simplest form; but in practice, there are many points of nicety to be attended to. Instead of being suspended by a string, the beam or bar is generally perforated in its centre, and turns on a knife-edge pivot; that is, in order to lessen friction as much as possible, the beam is frequently supported by nothing but a keen edge in contact with a polished plate of steel, agate, or crystal; for common commercial purposes, however, this nicety of adjustment is not required. There is also attention necessary to the position of the centre of gravity of the bar, with reference to the point of suspension: there is a point in every body called the centre of gravity, which is so far a central one, that all the matter above it exactly equals in weight that below it,—the weight on one side of it equals the weight on the other, and so on. Now it is found, that in order that a balance should have at the same time sensibility and stability, the centre of gravity of the bar or beam must be immediately *under* the axis or centre of motion, for if it coincided with that axis, the beam would remain indifferently in any position; and if it were above the axis, the beam would have a tendency to upset.

The mode by which the horizontality of the beam is determined is this: there is a little tongue or index projecting vertically from the beam, and this tongue, in common scales, passes through a slit in the piece of metal from which the beam is suspended; and when the tongue and this piece of metal are in the same plane, the tongue is conceived to be vertical, and the beam horizontal. In the balances constructed for scientific purposes, where the indications are measured with a greater degree of nicety, an index is sometimes fixed at each end of the beam, and near it is a graduated arc, by which it can easily be determined when the beam is horizontal: there are also other modes by which the horizontal position may be determined.

We have said that the stability of a balance depends on a certain position of the axis of motion. If this stability be maintained, the sensibility, or power of turning either way, will be greater as the length of the beam is greater, or as its weight is less, or as the load is smaller, or as the distance between the centres of gravity and of motion decreases. It has been the object therefore, in constructing scientific balances, to attend to all these particulars, and there have been produced balances whose sensibility was very remarkable. In one made by Fortin, when there was a certain weight in each scale, an addition of one-millionth part of this weight to one scale caused it to turn. Another, made by Ramsden for the Royal Society, gave still more remarkable indications: although weighing ten pounds, it was capable of being turned by one-thousandth of a grain being put into one scale, or one ten-millionth part of its own weight! It is found necessary to keep such delicate instruments as these enclosed in glass cases, as both currents of air and dust are liable to derange them.

Scales used for commercial purposes are frequently supported from beneath, instead of suspended from above. These are very convenient on account of the small space which they occupy; and although there does not appear, to a common observer, to be anything equivalent to a *beam* in them, yet they act nearly on the same principle as the suspended balance; there is a pivot beneath, and when the scales are empty, the weight of all the mechanism on one side of the pivot is just the same as on the other, so that the loading of the scales may proceed in the same manner as on any other construction.

In the balances which we have been considering, the length of the beam is divided precisely in the middle, so that the two arms are of equal length, and the beam remains horizontal only so long as there are equal weights in the two scales. But through a particular property in the lever, a balance with arms of unequal length may be employed, by a peculiar adjustment of the weight. When we say that if unequal weights be suspended from the two ends of a horizontal beam, the horizontal position is not disturbed, it is understood that the weights are to be at *equal distances* from the pivot, or axis round which the beam turns; if one weight be placed nearer to the pivot than the other, the beam will immediately change its position and become inclined, that end being lowest of which the weight is farthest from the pivot. From this it results, that if one of the weights be hung nearer to the fulcrum or pivot than the other, the weight must be larger in order that the beam may remain horizontal; and mathematicians are enabled to prove that the beam will remain horizontal, when the weight at the right hand, multiplied by its horizontal distance from the pivot, is equal to the weight at the left hand multiplied by its distance; or, in the language of proportion, the distance varies inversely as the weight.

Such a balance as we have just been considering, is the *steel-yard*, represented in *fig.* 3. This, we believe, was

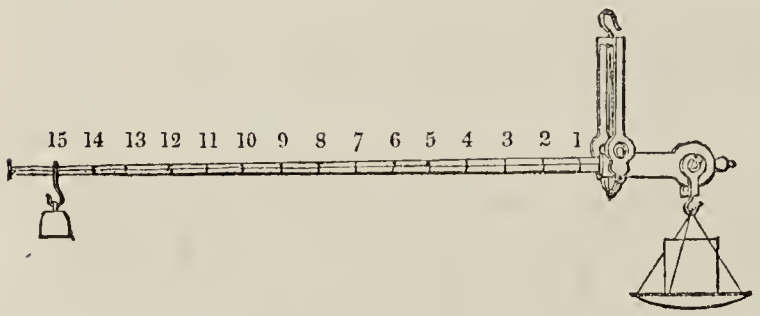


Fig. 3.

the form of the Roman balance, and has probably been used by various nations. There is, suspended from the ceiling or any other convenient place, a vertical piece of metal, through an opening in which a beam or bar may pass. The bar rests on a knife-edged fulcrum or pivot, so as to turn with great ease. One end of the bar is thinner and smaller than the other, so that in order that the bar may remain horizontal, the pivot must be nearer to the large than to the small end. Suppose now that a weight be attached to the shorter arm: the longer arm would evidently be carried upwards, unless a counterbalancing weight be attached to it. This is of course done; and it is a peculiarity in the steel-yard, as compared with the common balance, that *one* counterpoise is made equivalent to many different weights. The counterpoise is attached to the long arm so as to be able to slide along it, and in proportion as the weight attached to the small arm is heavy, so must the counterpoise be removed farther from the pivot. We have stated the relation that must exist between the weights and the lengths of the arms, in order that the beam may be parallel; and as, in the steel-yard, the counterpoise remains constant on the one side, and the distance of the weight remains constant on the other, it may be easily seen that the distance of the counterpoise from the pivot must be increased just in the same proportion as the weight of the body to be weighed. From this principle the long arm is graduated, with figures 1, 2, 3, 4, &c., which figures may represent ounces or pounds, according to the size and delicacy of the instrument. If then a weight be suspended from the small arm, and the beam be retained horizontal when the counterpoise is at 5, and if the weight be increased until, to preserve the horizontal position, the counterpoise must be at 7, the second weight will be greater than the former in the proportion of 7 to 5.

There is a balance called the Danish balance, and used in commercial matters in the countries near the Baltic, which differs from the steel-yard in this, that the counterpoise is fixed and the pivot moveable, whereas in the steel-yard the pivot is fixed and the counterpoise moveable. The beam is graduated in a contrary direction to that of the steel-yard, in order to adapt it to this change; and the beam has to be slid forwards or backwards according to the weight to be counterpoised.

In the common balance, the steel-yard, and the Danish balance, the beam is straight. But there are others called *bent-lever* balances, in which the weight is suspended from a bent arm, and counterpoised by a heavy knob at the other; and the degree to which the heavy knob ascends is made to indicate the weight of the article attached to the bent arm. There are various contrivances somewhat resembling this, but their indications are not very accurate; their principal recommendation is ease in using.

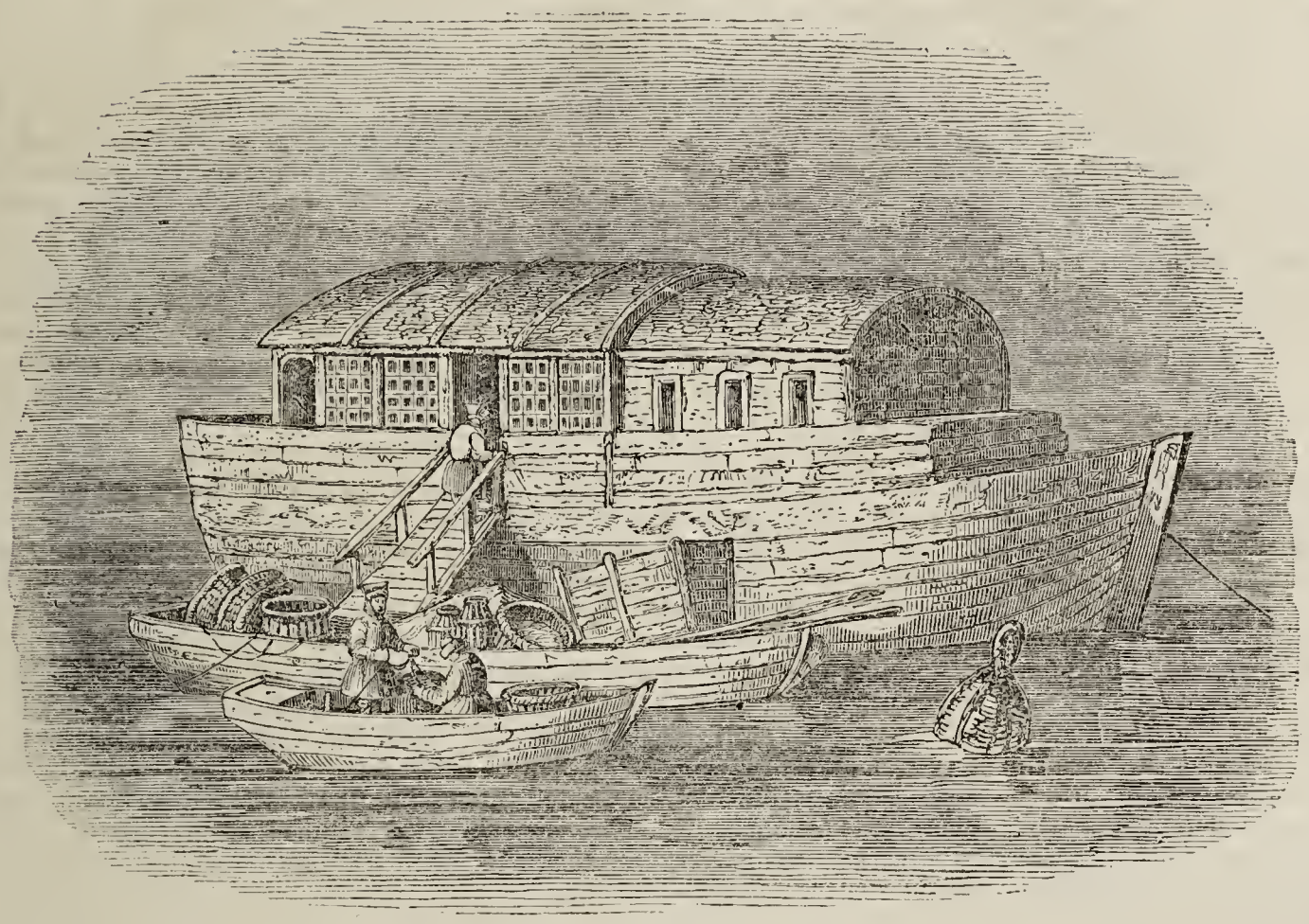
There are a large number of important contrivances, called "spring-balances," "weighing-machines," and "dynamometers," whose object is to indicate pressure, weight, or force, in various ways; but it would be impossible to describe them within the limits of the present paper, as many of them are very intricate. Generally speaking, the weight acts upon a spring, and the counterpoise carries an index hand round a dial-plate. We have purposely confined ourselves to those forms of weighing-machines more or less resembling a common pair of scales; and we may here remark, that the reader would derive instruction from noticing the modes of action of the numerous "letter-balances" that have been devised since the introduction of the penny postage: the common balance, the steel-yard, the Danish balance, the bent-lever balance, and the spring-balance, under a great variety of forms, have been employed for this purpose, some of them with very great ingenuity.

In speaking of the common scales, we have said nothing of the nature of the weights employed: the curious details connected with that subject will occupy a separate paper.

Rich and Poor.—The labouring people are only poor, because they are numerous. Numbers in their nature imply poverty. In a fair distribution among a vast multitude, none can have much. That class of dependent pensioners called the rich is so extremely small, that if all their throats were cut, and a distribution made of all they consume in a year, it would not give a bit of bread and cheese for one night's supper to those who labour, and who in reality feed both the pensioners and themselves. But the throats of the rich ought not to be cut, nor their magazines plundered; because, in their persons they are trustees for those who labour, and their hoards are the banking-houses of these latter. Whether they mean it or not, they do, in effect, execute their trust—some with more, some with less fidelity and judgment. But on the whole, the duty is performed, and everything returns, deducting some very trifling commission and discount, to the place from whence it arose. When the poor rise to destroy the rich, they act as wisely for their own purposes as when they burn mills, and threw corn into the river, to make bread cheap.—*Burke's Thoughts and Details on Scarcity.*

THE MARKETS OF ST. PETERSBURG.

[From a Correspondent.]



[Fish-Bark of St. Petersburg.]

The engraving above represents one of the fish-barks of St. Petersburg,—those floating fishmongers' shops in which are bought and sold all the fish consumed in the capital during the summer. This ark is surrounded by numerous floating cisterns and boats, either pierced with small holes to admit the clear waters of the Neva, or filled with salt water for the natives of the sea. This is, as I have said, only during the brief and concentrated summer season; for in winter, food of all sorts—fish, flesh, and fowl, are as if petrified, and handled and clapped together like fragments of hard leather, or those wooden joints the London ironmongers hang on their bottle-jacks in the windows just to keep them revolving. I have oftentimes at table hesitated between fish from Archangel and Astrachan, until the appearance of the produce of Lake Ilmen or the Volga decided my choice. In the summer then, about eight or nine o'clock in the morning, the housewife begins her marketing for fish, dressed in a loose gown and shawl, without boddice, and corsetless, with a handkerchief bound round her head, although she may be the wife of a merchant and her full dress may be satin and gold tissue, while her daughters may parade on the palace quay in all the pomp of the last Parisian mode. She is attended by a dvornick, a sort of servant used for any purpose, to chop wood, fetch water (remember, there is no water laid on from pipes), and light the stoves: he is provided with a basket of interwoven chips of wood, and he looks the very personification of dull stupidity in his coarse full coat of frieze, enveloping a coarse blue or red striped shirt, the skirts of which hang pendent outside his linen drawers—his brawny neck open, and chin abundantly hairy—his thick leather gloves, made like a hedger-and-ditcher's, without fingers, an indispensable article with the Russ, from necessity in winter and from habit in summer—while a cap at one extremity, and a pair of hard brown immense boots at the other, complete his costume.

The economical matron carefully steps along the railed plank conducting her from the granite-lined quay to the floating shop. Inside, the first object that meets the eye is the picture of the patron saint, St. Ivan or St. Nicholas most likely, with an ever-burning lamp before him. Having reverently crossed herself, and replied to the obsequious bow of the pious fishmonger, who stands cap in hand before her, with the morning salutation of "Zdrastvonitee, bratt" (Good morning, brother), she applies herself to business, and he conducts her down the sloping plank to his reservoirs of fish, and dips out with a small landing-net whatever she makes choice of, returning them to their element if not approved, until, being satisfied, the fish are weighed, and, with much altercation and hard bargaining, the roubles are disbursed and the dvornick laden. The price is then calculated on the *Stchoti*, a small wooden frame strung with wires, on which slide small ivory balls, like the ancient abacus, the first wire being for kopecks, of which 100 go to the rouble, the next for units, then tens of roubles, and so on, without which machine no sort of calculation in shop, counting-house, or bank is ever made, and really with surprising accuracy and rapidity, in complicated amounts involving the four rules of arithmetic.

A few random records of the markets for other provisions may not be unacceptable. About half-way up the Nevskoi Prospeckt, on the right-hand side, is what is called "The Shops,"—the *Gostinnoï Dvor*. They consist of a huge quadrangle, about the size of Lincoln's Inn Fields, of small shops built under a continuous arched piazza, which runs all round, with a similar covered way above it forming an upper story, and to which you ascend by flights of steps at intervals. This upper range is devoted to the sale of furs and skins and cloth clothes, and beneath is the great emporium for nearly everything that money can buy. For the most part the shops are open in front, the owner sitting behind the counter drinking tea out of a tumbler, without milk, but with a slice of lemon in it, or else, when he is

not inviting the passer by to try his wares, he is playing a game of draughts with his next-door neighbour. No fire or candle is permitted in this huge bazaar, and it is therefore closed by dusk. The various trades are classed together—here a group of shoemakers, dealers in glass and china—there lincndrapers, and sellers of pipes, and pictures and books, and so on. No name or label indicating the calling of the owner, save a painting on the shutters, blazoning forth in bright colours effigies of the wares within—shawls, hats, ribbons, or shoes, daintily designed and groupcd after nature. The interior of this quadrangle is like a caravansary, filled with outhouses, carts, beasts of burthen, and empty packages. Adjoining this is an irregular low mass of buildings called the *Tolkoutchoï Rynok*, in English the "Push Market," indicative of the pushing and shoving necessary to penetrate it. Here all the manufactures or natural productions of the earth that were not in the other market are to be found. Ranges of shops for furniture, ironmongery, and other goods gradually descend into Rag Fair and Monmouth Street,—second-hand clothes of all sorts, old furniture, leather gloves and the worsted ones worn inside of them, old books, pipe-tubes and tobacco-pouches,—those huge hard leather boots and those convex cloth caps that every moujik (boor) wears—these last being mostly vended on stalls in the open air, or heaped on the ground in rows intersected by boarded passages, for the multitude that frequents this place, a medley mass of Jews, Armenians, Tartars, Greeks, Calmucks, Muscovites (your true Muscovite is as different from the adulterated Petersburgian as your Londoner is from the Gael). Here the glass case of the money-changer tells you where you can change paper for silver money—blue notes for five roubles (4*s.* 4*d.*) and red notes for ten roubles (8*s.* 8*d.*) being much more abundant than silver, gold, or platina coin. There an open stall supplies you a glass of *kvass* with a lump of ice in it, deliciously cool, for two kopecks (ten being equal to a penny), and a goodly drink it is, a pleasant vegetable acid, like well made barley-water with lemon-juice; or still better, a tumbler of effervescing *kislistchee;* or a man serves you, from a brazen urn enveloped in flannel, a glass of warm *sbiten*, which is a hot liquor made of honey and spices, with a sprinkle of ground pimento; while another from a glass jar dispenses *klukva*, or cranberry-juice; or a dealer in gingerbread, made of brown paper, straw, and coarse rye flour, invites your attention, till he is interrupted by another clamorous in praise of his *pastelar*, a compound, by no means despicable, of honey and pulp of apples. But that quiet-looking man in a ragged apron, with a tray before him, waits patiently till the moujik comes to buy of his hard mahogany-looking *horse-flesh*, with a slice of black bread and salt, or a hard-boiled egg, for his frugal dinner. This scene is yet more enlivened with the cries of the itinerant dealers in rudely executed prints coloured in red and yellow, and sellers of slippers from Cazan, or schlaf-rocks* from Tartary of shawl patterns, or that twisted sort of cake called cringles from Moscow, or the barterers for money of ikonas, pictures of their saints which they must not sell downright;—those noises and yells, added to the shrill treble of the women quarrelling about prices, and the hoarse bawls of the stall proprietors recommending their goods as follows, make as full a picture of the Tolkoutchoï Rynok as we can sketch:—"*Kharosho tchai*" (excellent tea): here at least they are right, for I never tasted such fine-flavoured tea as you buy for ten roubles a pound, transported overland. "*Precrasnie sapagee*" (capital boots), that is, until you begin to wear them. "*Sami louchie vino zdes*" (the very best wine).

I went to one stall (a bookseller's) to carry away some memorial of my visit. I was immediately recognised as an Englishman, and the owner, as the most acceptable book, produced an old volume of the 'Gentleman's Magazine,' about sixty years old. Curious to know how highly Sylvanus Urban was rated here, I asked his price. "*Dvatsat roubleï*," he promptly answered—only twenty roubles! I offered him half a rouble; he saw I was in earnest. "*Karasho, izvolté*" (very well, if you please).

Disentangling yourself from these, a cool vista before you presents fruits and vegetables piled up on both sides, fragrant in smell and pleasant to the eye; this is the Fruit Market, *Ovoschnoï Rynok*. Fruits from the Ukraine, apples from the Crimea, grapes from Astrachan, abundance of oranges and lemons, fresh cranberries, water-melons, and raspberries, form a pleasing contrast to the humanity in a state of fermentation you have just left; all except the tubs of putrefying mushrooms and the sour cabbage (*Schtschi*), great favourites and delicate cates to the Russ. About fifty species of mushrooms are eaten with impunity, and not above three or four reckoned as *paganie*, or poisonous. Then there is the salted cucumber—small thick yellow cucumbers—how exquisitely cool and beautifully sapid!—a vegetable lemon ice.

There is yet another arcade, called *Moscotilnoï Riad*, for the sale of drugs and spices, and all sorts of roots, and seeds, and barks, and twigs, and flowers; and another, which is the Bird Market—birds of every description, alive and dead, and, *inter aliâ*, the Rapscha, or white-fleshed partridge, owls and hawks tied by the leg, and small birds hung up in little red cages, and invariably a large black cat, attending his master with mock affection, and, when his broad seamless back is turned, manifesting it by embezzling a young bird from his museum. "Why don't you kill that cat?" I asked of one of these chapmen. "*Stcho dielitt?*" (what's to be done?) the eternal reply of the resigned Russ: "It would be unlucky." So he quietly continued his occupation, which was taking a mouthful of water and squirting and sputtering it over some green herbs to refresh them: these herbs will stuff his geese and turkeys! Pigeons are the only birds you will not see exposed for sale, but which you cannot help seeing alighting in flocks in every street, and lazily hop away from your feet; while bigotry forbids even cooks to dress them for your profanely watering mouth, simply because the pigeon (*quasi* dove) is the emblem and type of the Holy Spirit: thus all Petersburg is a vast pigeonry of uneaten pouters and fantails, and they die their natural deaths whenever they choose.

* Morning gowns.

THE VALLEYS OF THE TEES AND THE TYNE.

[From a Correspondent.]

These valleys comprehend two of the most extensive, fertile, and beautiful districts of country probably anywhere to be met with in the six northern counties of England; and although they are here classed under the same head, they have no other affinity or connection with each other, excepting that the head-waters of several of the principal branches of them both have their origin in that extensive mountain-range which bounds Yorkshire to the westward,—afterwards separates that county from Westmoreland,—then Durham and Northumberland from Westmoreland and Cumberland,—and afterwards branches off into some of the south-eastern counties of Scotland, and gives birth to the Tweed, the Teviot, and other fair streams over the Border. Both these valleys are named after the respective rivers that water them throughout their whole length; and notwithstanding there being an intermediate valley betwixt them, namely, Weardale, which is watered by the river Wear,—this river certainly does not flow through so fine, fertile, and picturesque a region as either of the other two, and consequently is an object of less general interest. It must

be admitted, however, that the seenery on the Wear in some particular places, and among them that in the immediate vicinity of the ancient city of Durham, is scarcely, if at all, exceeded in interest and beauty by anything connected with either the Tees or the Tyne; while the port of Sunderland near its mouth (including Bishop and Monk Wearmouth) has become a large and important borough, possessing a valuable trade both coastwise and foreign, in addition to the vast quantities of coals brought down from the interior of the country by sundry railways for shipment; and the famous iron bridge thrown across the river at this town by the late Mr. Burden, at an elevation so great that tall-masted ships sail under it with ease, for many years after its erection was considered the wonder of the North, for *then* it certainly had no rival within the limits of the United Kingdom of Great Britain.

The river Tees has its source in that section of the mountainous range of country, already alluded to, lying between Westmoreland and Cumberland, and the county palatine of Durham; and scarcely a more bleak and barren region is to be found in England than that where one of its infant branches, although not yet dignified with the name Tees, serves as the boundary-line betwixt small portions of Cumberland and Durham; although these mountains are so wild and desolate, that in some situations the limits of the adjoining counties are disputed, or not known at all. These streams, in the provincial language of the country, are called "beeks;" but when we approach the Tyne they receive the Scottish appellative, and are called "burns." After several of these mountain brooks have united, and something near thirty miles (following the course of the river) in a northwesterly direction from Bernard Castle, the Tees receives its name, and from thence to the sea forms the boundary between Durham and the North and East Ridings of Yorkshire. The valley that it first waters, until it reaches the point where it leaves the lower range of hills near the ancient walls of Bernard Castle, is called Teesdale; but shortly after it has escaped from its pent-up course, it enters a fine champaign country, when it is no longer called a dale or valley, but the Vale of the Tees. Teesdale, however, must not be passed over with so slight a notice, for there is not a more picturesque valley in the range of mountains to which it belongs. It contains, however, no towns of any note; Romaldkirk, on the Yorkshire side, and Middleton-in-Teesdale on the Durham side, are the principal villages found in it. But as there is no road or thoroughfare of any note through this valley, few individuals, except those who go in search of the picturesque,, are induced to travel by the roads leading through these hilly districts. The road, however, from Bernard Castle up this valley, affords a variety of beautiful views—some of them grand and romantic; for from various points, rocks, wood, and water present themselves to the admiring traveller in combinations, so as to form many agreeable and some truly sublime pictures. But the wonder of the whole valley is the *Force*, or Fall of the Tees, which has not its equal in the vast range of mountainous country already spoken of; a short description of which, taken from the pages of a tourist who visited these scenes—that still remain unchanged, several years ago, will show the vivid impression they made upon the astonished beholder. "Upon reaching the banks of the Tees where it pours down the rocks, steeps clad with wood prevent you from seeing it, but the roar is prodigious. Making use of our hands, as well as feet, and descending almost like parrots, we crawled from rock to rock, and reached from bough to bough, till we got to the bottom under the noble fall. Noble indeed! for the whole river (no trifling one) divided by a single rock into two vast torrents, is poured down a perpendicular precipice of near fourscore feet! The deluging force of the water throws up such a foam and misty rain, that the sun rarely shines without a large and brilliant rainbow appearing. The whole scene is gloriously romantic, for on every side it is walled in by pendent rock one hundred feet high,—here projecting in threatening cliffs,—and there covered with hanging woods, whose only nourishment one would imagine was derived from the descending spray." . . . "The eighteen miles from Bernard Castle to the Fall of the Tees richly merits the epithet delightful; I never yet travelled such a line of country so astonishingly fine, and containing such a noble variety. It is a continued landscape, sufficient to captivate the most languid observer: a glorious range of bleak mountains, fertile valleys, beautiful enclosures, hanging woods, steep precipices, tremendous rocks, winding streams, and beautiful cascades. The whole line is a perpetual hill and dale, thickly strewed with all these romantic glories: literally speaking, you do not move one hundred yards without being struck with continual waterfalls. This is a ride well worth a thousand miles travelling!"

Notwithstanding the natural beauties of the ride here referred to, there are no gentlemen's seats or mansions except one or two of a third-rate class; so that art has not contributed much towards rendering these scenes enchanting. Probably there being but one easy approach to Teesdale, by which the inhabitants have an opportunity of reaching a tolerable market, may have operated as a principal cause against its becoming the summer residence of a few genteel families. A considerable portion of the moorland and hills lying between this valley and Weardale has, at some early period, been forested, and it still retains the name of Teesdale Forest.

About four miles below Bernard Castle, where this river washes the ruinous walls of the once stronghold that lends its name to the present market-town, the Greta, a considerable stream flowing from the west, and having its source among the wilds of Stanemoor, falls into the Tees. The streams unite near Rokeby, the vicinity of which was immortalised in song something more than twenty years ago; and although the scenery in the neighbourhood from which Sir Walter Scott sketched his poem of 'Rokeby' is neither particularly sublime or romantic, it is hardly surpassed in loveliness throughout the entire length of the Tees. The North Road (the western one) from London to Carlisle, and thence to Glasgow or Edinburgh, passes through the village of Greta Bridge. It is in this part of the Vale of the Tees that the moors and uplands recede farther to the right; and from hence the vale opens out into a wide extent of country. On the left or Durham side the country is no longer waste or mountainous, though here and there somewhat hilly; while eastward, at the distance of scarcely three miles, is the pretty little town of Standrop, adjoining which is the extensive park containing that splendid baronial mansion Raby Castle. But neither Raby, nor Streatham Castle, which lies between it and the Tees, is considered as coming, properly speaking, within the limits of the valley attached to that river.

Following the course of the river, we first pass the village of Winston, and then Gainford, the fertility of the country around the latter being rarely equalled; and presently afterwards the two Conscliffes—one on each side the river; and although the country around them is neither hilly nor broken, the name clearly implies a rocky locality,—and such really being the case, for in several places rocks and cliffs of fantastic shapes overlook the deep pools and eddies in this part of the river. All along this section of the valley, which has now opened out into a fine grazing country (though intermixed with lands under tillage), finer specimens of cattle—the Durham short-horns—are nowhere to be met with. In fact the Vale of the Tees is the district where a few spirited farmers effected such wonders in the breed of this particular sort of cattle. Before the river reaches the pretty

village of Croft, the interesting town of Darlington is passed, lying north-east about two miles. At Croft, the Great North Road from London to Edinburgh crosses the Tees; as also does the North of England railroad now progressing towards completion, the *terminus* (for the present) will be a shorter distance from Darlington, and in connection with the railroad from thence to Stockton.

Presently, after passing Croft, that fine agricultural district on the Yorkshire side of the river, called Cleveland, begins; and although there are no precise limits assigned to it, it is generally considered as stretching southward to North Alterton, and probably to Thirsk, or farther; and towards the south-east it is only bounded by the range of bleak moorlands extending from the sea westward far into the interior. It is somewhat remarkable, that the family of Vane derive no fewer than three titles from the Vale of Tees, namely, Duke of Cleveland, Earl of Darlington, and Lord Bernard.

The Tees, after continuing its general course (east inclining to the south), its channel becomes very crooked, diverging occasionally towards every point in the compass; so that were it navigable here (which is not the case), it would afford but an exceedingly circuitous navigation. In the vicinity of Dinsdale and Middleton-one-row (5 miles from Darlington) are spas, which of late years have attracted much company. At the small market-town of Yarm (4½ miles from Stockton) the influence of the tide is first perceptible, from whence it is navigable by boats to the port of Stockton-upon-Tees, which is not only a beautiful little compact town, but is frequented by many vessels, although it has a river navigation of at least 12 or 15 miles. But owing to the crookedness of the river, a few years ago a railway was constructed to a place lower down called Middlesborough, where a smart-looking little town has sprung up, and where the larger ships load and unload. Another railroad brings down coals from the interior of the county to this place; so that coals, as well as merchandise and other articles, have of late been exported from the Tees to the London and other markets.

Probably the most splendid and general view of the broad expanse of the Vale of the Tees is from one of the many elevated points in the range of hills beyond Stokesby, or from the summit of the cone-shaped Roseberry Topping. From thence you look down upon the rich and finely cultivated district of Cleveland in the immediate foreground, with its towns, villages, and neat farm-houses, as well as upon all the Durham side of the vale; also embracing the entire country eastward to the sea, including the peculiarly situated town of Hartlepool, and the sea itself, with its numerous vessels—the dingy-coloured colliers and the white-sailed merchantmen. The various windings of the river may be distinctly traced as it sweeps gently down from the vicinity of Darlington; and farther still it may in several places be seen, like a bright silver thread, even to the neighbourhood of the moorlands, from which it escapes near Bernard Castle. Throughout this whole extent, when the atmosphere is bright and clear, to the eye that is familiar with all the localities of the Vale of the Tees, the seats and mansions of the gentry, which are far from numerous, may be distinctly pointed out.

[To be continued.]

Flowers.—Plants may be multiplied in many ways, by budding, grafting, inarching, by layers, pipings, and cuttings, by suckers, the division of roots and tubers, and by seed; and there are very few species from which by some of these methods an increase cannot be obtained. So easy indeed is the multiplication of plants, and so large a number of new plants can with proper management be raised from one original stock in the course of a year, that the nursery gardeners find it impossible (excepting in rare instances) to maintain a high price for a new flower beyond two or three years: the first year the price of a new flower may be 5*l.*, the second it will be about 30*s.*, the third year not more than 2*s.* 6*d.* The method applicable to the greatest number of plants, and which is successful with ordinary management, is that of cuttings: from the parent plant small slips or cuttings are taken where the wood is not very tender, and, if practicable, at a joint. The cuttings should be planted about two inches apart, in large pots or boxes, and the pots placed in a moderately warm hot-bed, shaded from the sun. In about a fortnight they will strike root, and begin to grow. They should then be gradually hardened, be put, as far as practicable, into separate pots, and removed into the flue-pit, where plenty of air must be given them in the day-time to prevent their damping off, and a fire be lit before frosty nights: the additional security of mats thrown over the frames must be used when the weather is unusually severe. The time of removing the plants from their winter-quarters must depend upon their nature and the climate in which they are to grow. The last week in May or the first in June is the earliest time at which the tenderest will bear a thorough exposure; for one or two previous weeks they should be hardened by gradual exposure to the wind and cold nights, care being taken to protect them with mats if either should be in excess. The cultivation of dahlias is commenced in the second or third week in February, when the roots which have been taken up in the autumn should be put into a hot-bed, kept, as far as practicable, at a uniform heat of 62° to 65°; a little of the earth in the bed should be spread over them, and water liberally given them once a day. The roots will then push out suckers, one from each eye; these should be separated from the bulb: a few fibres of the old root being torn off with them, and being treated after the manner of cuttings, will strike and be ready to plant out at the end of May. It is a fault with gardeners generally that their dahlias flower too late. The first flowers are seldom perfect, and it often happens that the plants have not long reached their prime before they are either pinched by cold nights or perhaps altogether destroyed by frost. It is therefore desirable that the plants should never be checked in the early stages by want of heat or otherwise. Perennial herbaceous plants may be easily multiplied by dividing the roots either in the autumn or in spring. Annuals are principally raised from seed sown in April and May, either upon a hot-bed, from which they must be transplanted, or in the situation in which they are to grow. Sweet-peas and mignonette, nemophylla insignis, poppies, &c., are very shy of being transplanted, unless from pots. Mallows, ehoriopsis, China and German asters, French and African marigolds, eutoca viscida, nolana prostrata, &c., will be better raised on a hot-bed. New annuals are continually produced: we do not however consider them generally as a desirable class of flowers. There are two methods of arranging flowers with a view to their display—1st, putting each species in a separate bed; 2nd, mixing two or more species in one bed. Each has its merits, and in every garden both should be practised. When flower-beds situated close to each other are to be filled with one species only, it will be requisite to consider the height and colour of the flowers to be planted, that both symmetry and harmony may be preserved. Yellow flowers, especially among those that grow from six inches to two feet in height, are more numerous than flowers of any one other colour, and care must be taken not to plant them in undue proportion. When several species are to be planted in the same bed, the largest bed must be chosen, the tallest species be placed in the middle, and various colours mixed together; sufficient space should be left for each plant to grow freely without interfering with or confusing its branches with those that are next to it. Flowers for the most part like a rich, light, new soil. The spot chosen for a flower-garden should be dry, open to the sun, and sheltered from wind and cold.—*Penny Cyclopædia.*

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WALTHAM ABBEY.

[Waltham Abbey, from the north-west.]

Waltham Abbey, or Holy Cross, is situated on the eastern bank of the river Lea, at the distance of twelve miles and a half from London; the latter name is derived from a holy cross, asserted to have been brought hither by miraculous means during the reign of Canute. Tovi, standard-bearer to Canute, founded here a religious house for two priests, to whose charge the sacred relic was committed. After the death of Athelstan, the son and successor of Tovi, the estate, it appears, reverted to the crown. The lordship was then given by the monarch (Edward the Confessor) to Harold, on condition that he should build a college, and furnish it with all necessaries, relics, dresses, and ornaments, in memory of Edward and his spouse Editha. Harold in consequence rebuilt the church, increased the number of priests to twelve, one of whom was the governor, under the title of dean, gave it ample endowments, and, so far as the time permitted, made it an excellent school of learning. No less than seventeen manors were granted on this occasion by Harold, and confirmed to the establishment by the charter granted by Edward. Previous to the fatal battle of Hastings, Harold here offered up his vows, and afterwards was brought here for interment with his two brothers, by their miserable mother Githa, who with great difficulty obtained Harold's remains from the Conqueror. The canons on Harold's favourite foundation also experienced William's resentment; it is said that he despoiled them of all their moveable wealth; their lands, however, he left nearly entire. Waltham continued a college until 1177, when it was dissolved on account of the lewdness and debauchery of the members, by Henry II., and an abbey for regular canons founded in its stead, whose number, according to Farmer, in his 'History of Waltham Abbey,' amounted to twenty-four. The Conqueror's charter was confirmed, as were also various subsequent additional grants, and two new manors were granted.

In 1191 Waltham was made a mitred abbey. Richard I. gave the abbey the whole manor of Waltham, with the great woods and park called Harold's park, and other lands, as well as the market of Waltham. Henry III. frequently resided here, and, as a mark of his favour, granted the Abbey a fair, to be held annually for seven days. During this reign the church was again solemnly dedicated in the presence of the king and many of the principal nobles. The body of Edward I. was brought here in 1307, with great pomp, where it remained for no less than fifteen weeks, during which time six religious men were chosen weekly from the neighbouring monasteries to attend it night and day. The abbey was surrendered to Henry VIII. at the dissolution, on the 23rd of March, in the thirty-first year of his reign, by Robert Fuller, the last abbot, who had previously made a vain effort to avert the impending ruin by presenting the king with the magnificent seat of Copt Hall. The net annual income at this period was 900*l.* 4*s.* 3*d.*

The only remains of the monastery are, a portion of the conventual church, which now forms the parish church, an entrance gateway and bridge across an arm of the Lea, some vaulted arches forming a kind of dark passage of two divisions, and some broken walls. The church must have been a magnificent specimen of Saxon architecture, if it were only from its great size. An idea

of the extent may be conveyed by stating that the site of Harold's tomb, which stood either in the east end of the choir, or in a chapel beyond, is no less than one hundred and twenty feet distant from the termination of the present edifice. The original church consisted of nave, transept, choir, and chapels. There was also a large tower rising from the intersection of the transept, containing "five great tuneable bells." Part of this tower having fallen, the remainder was undermined and blown up, the choir, tower, transept, and east chapel at once demolished. The nave and some adjacent chapels alone remained; the nave, as we have before stated, with its side aisles, forms the body of the present church. This is about ninety feet in length, and in breadth, including the side aisles, forty-eight feet: it is in the Norman style, with round massive piers dividing the nave from the aisles, semicircular arch, and zigzag enrichments. One of these piers on each side is decorated with spiral and another with very bold and rude zigzag indentations, which, it is supposed, were formerly filled up with brass or other metal. Above the first range of arches, supported on the piers we have mentioned, are two other tiers of arches: those of the second tier corresponding in width with those of the first, but being lower in height; the arches of the third tier are three to each arch of the lower tiers, with a window pierced in the middle one. The roof is modern and plain. At the west end of the church is a heavy square embattled tower, eighty-six feet high, bearing date 1558. From the south side of the church projects the Lady-chapel, now used as a vestry and school-room, under which is a fine arched crypt, "the fairest," says Fuller, who was the incumbent from 1648 to 1658, "I ever saw." Another little chapel, at the south-east end, is now a repository for rubbish. These chapels have some beautiful portions in the decorated English style. The windows in the south aisle have been but little altered. There is a fine wooden screen, bearing the arms of Philip and Mary, and a font, which appears to be very ancient. Near the screen there was formerly a painting on glass of Harold; this was destroyed by the Puritans during the reign of Charles I. Farmer observes that the church "is observed by all artists, and the most curious, to stand the exactest east and west of any other in Great Britain." The abbey refectory is reported to have stood eastward of the church, and the stables on the spot now known as the Abbey farm. The gateway we have mentioned is in a much later style of architecture than the church. In the gardens formerly attached to the Abbey is a tulip-tree, said to be the largest in England. Its circumference is stated, in Lewis's 'Topographical Dictionary,' to be nine feet six inches. Two stone coffins have been found at different periods, each of which was at first thought to be Harold's, but there appears to have been no proof of the correctness of the supposition.

The river Lea, at Waltham, divides into many small islands, bordered by fruitful meads and connected by bridges. These branches are traditionally said to flow in the channels originally made by Alfred, when he altered the course of the river, and left the Danish fleet dry on the shore.

The town of Waltham Abbey consists principally of one long street, irregularly built, about the centre of which stands the church. There are many good houses. The place is somewhat famous for its gunpowder manufactory. In one year (1813) no less than 80,000 barrels were made. The government powder-mills still employ many hands. The printing of silk handkerchiefs and the manufacture of pins are carried on to some extent; and in the neighbourhood is an extensive establishment for throwing and spinning silk. The schools and charities are numerous. There are meeting-houses for Baptists and Wesleyan Methodists. The market-day is Tuesday, and the fairs are the 14th of May, 25th of September, and 26th of September. This last is a statute fair. Population, in 1831, 2097.

Near the Abbey mills is a wide space of ground called the Bramblings, but formerly known by the name of Rome-land; owing, it is supposed, to the rents having been appropriated to the see of Rome. On this spot Henry VIII. had a small pleasure-house, which he occasionally occupied in his visits to Waltham. One of these visits led to an important event—the introduction of Cranmer to Henry, and his consequent elevation to influence and authority. The circumstances are thus related in the 'History of Essex:'*—"Henry VIII. possessed a house at Waltham, in the place called Rome-land, adjoining the abbey. Happening to pass a night there in 1529, his secretary, Dr. Stephens (afterwards so well known under the name of Gardiner), and his almoner Dr. Fox, afterwards bishop of Hereford, were lodged by the king's harbingers at the house of Mr. Cressey of Waltham; at the same time Dr. Cranmer and the two sons of Mr. Cressey, his pupils, were living there, being obliged to leave Cambridge on account of the plague. At supper, the conversation turning on the king's divorce, a common topic, discussed everywhere at that time, the courtiers, knowing the sound judgment and learning of Dr. Cranmer (with whom they had been previously acquainted), wished to have his opinion on the subject; which he modestly declined, but said that if the marriage were unlawful by any divine command or precept, the dispensation of the pope could not make it otherwise; and that it appeared to him an easier way to have the opinion of the learned men of our own and foreign countries; for if they decided in favour of the king, the pope must soon come to a conclusion which otherwise would not be effected by long fruitless negociation at the court of Rome. On their return to Greenwich, Dr. Fox acquainted the king with this new suggestion. Henry seemed highly delighted with the idea, and in his blunt manner declared "the man had got the right sow by the ear." Cranmer was immediately sent for to court, where he came very reluctantly. His subsequent history is too well known to need further notice here. We may merely observe that he was almost immediately sent on an embassy to Rome, and made archbishop of Canterbury four years after.

THE VALLEY OF THE TEES AND TYNE.

[Concluded from No. 522.]

The Valley of the Tyne, properly speaking, may be considered as extending from the sea at Tynemouth westward to the mountainous region already mentioned as stretching through a considerable part of Yorkshire, separating Westmoreland and Cumberland from Durham and Northumberland, and thence across the borders into Scotland. Previous to entering upon any local description of the country traversed by the river Tyne, it should be observed, that at the distance of about thirty miles from the sea it forms two branches, one being named the South Tyne and the other the North Tyne; and notwithstanding that the branch coming from the north has a considerably longer course, and serves as a channel to carry off the water from a much greater extent of country, it is the south branch that continues the general westerly direction of the first thirty miles of the valley onwards to the borders of Cumberland, and hence, by such as possess little knowledge respecting its sister stream, this is generally considered the main branch of this river.

The head-waters of the south branch interlock with the tributaries of the Wear in the mountain district in which is situated the town of Alston Moor, a district where lead-mining is the employment of most of the inhabitants; and here it may be remarked that lead-

* By Elizabeth Ogborne.

mines are common and even numerous in many situations both on the head-waters of the Tees and the Wear. Other branches rise on the confines of Cumberland, where they interlock with the tributaries of the Eden. Immediately at the extremity of the south valley of the Tyne there is so considerable a declension in the mountain-range, that it has been selected for the pass through which the railroad from Newcastle to Carlisle has been made. Descending the valley from Glenwhelt, a small village romantically situated in a deep valley one mile south of the old Piets' wall built nearly 1600 years ago, the only two places of any consequence at all lying westward of Hexham are Haltwhistle and Haydon Bridge. Two miles above the latter place the Allen pays its tribute to this branch of the Tyne, being the only tolerable-sized stream that enters into it. The soil generally, in this upper section of the valley, is by no means fertile, and the breadth of the flat land along the stream is very limited, even so much so that the railroad occasionally had to be dug out of the steep banks immediately adjoining the river. Below Haydon Bridge the valley widens so much that the river stretches away northward for three or four miles, after which it again turns to the east, and about a mile to the north of the ancient town of Hexham it is joined by the North Tyne. Hexham is a good-sized market-town, but has not much to recommend it to particular notice besides a fine old collegiate church.

Having reached the place where these rivers unite, some notice of the north branch may be appropriately introduced. The North Tyne is formed by the junction of two main branches of nearly equal size, both having their source in wild and mountainous regions (the commencement of the Cheviots), and on the very confines of Scotland. The general course of the more northerly of these being nearly due south, while that of the other is eastward, inclining a little towards the south. They unite a couple of miles below Bellingham, and follow the course of the river about twenty miles to where it unites with its sister branch, the South Tyne. Although the valleys of the upper parts of the two main branches, as well as several others down which tributary burns (streams) flow, are thinly peopled and partially cultivated, on the whole there is hardly a wilder range of mountain wastes to be met with England. In former times, particularly during the period of fierce border feuds, the inhabitants of those parts, as well as those on the head-waters of the Wear and Tees, were accounted the rudest people in all England. If such were then really the case, a greater improvement has been effected amongst them than among the other mountainous and isolated districts elsewhere; for although the peasantry are still in a great measure uneducated, superstitious, and rude in manners at the present day, they are not a whit more so than those inhabiting other mountain regions in the north: in mining districts in general but little can be said in favour of the morals of the people. The western route from Newcastle to Edinburgh traverses the upper section of the more north-easterly branch of the North Tyne. Throughout the great extent of country whose waters are drained off by the North Tyne, if we except the insignificant town of Bellingham, there is not a market-town existing, and scarcely any village of any note, although downwards from Bellingham a finer country can scarcely be imagined, the wild and barren regions being left behind. It is not only in a high state of cultivation, but abounds with parks, country-seats, and elegant mansions; and these particular features continue after the junction of the two rivers near Hexham all the way to Newcastle.

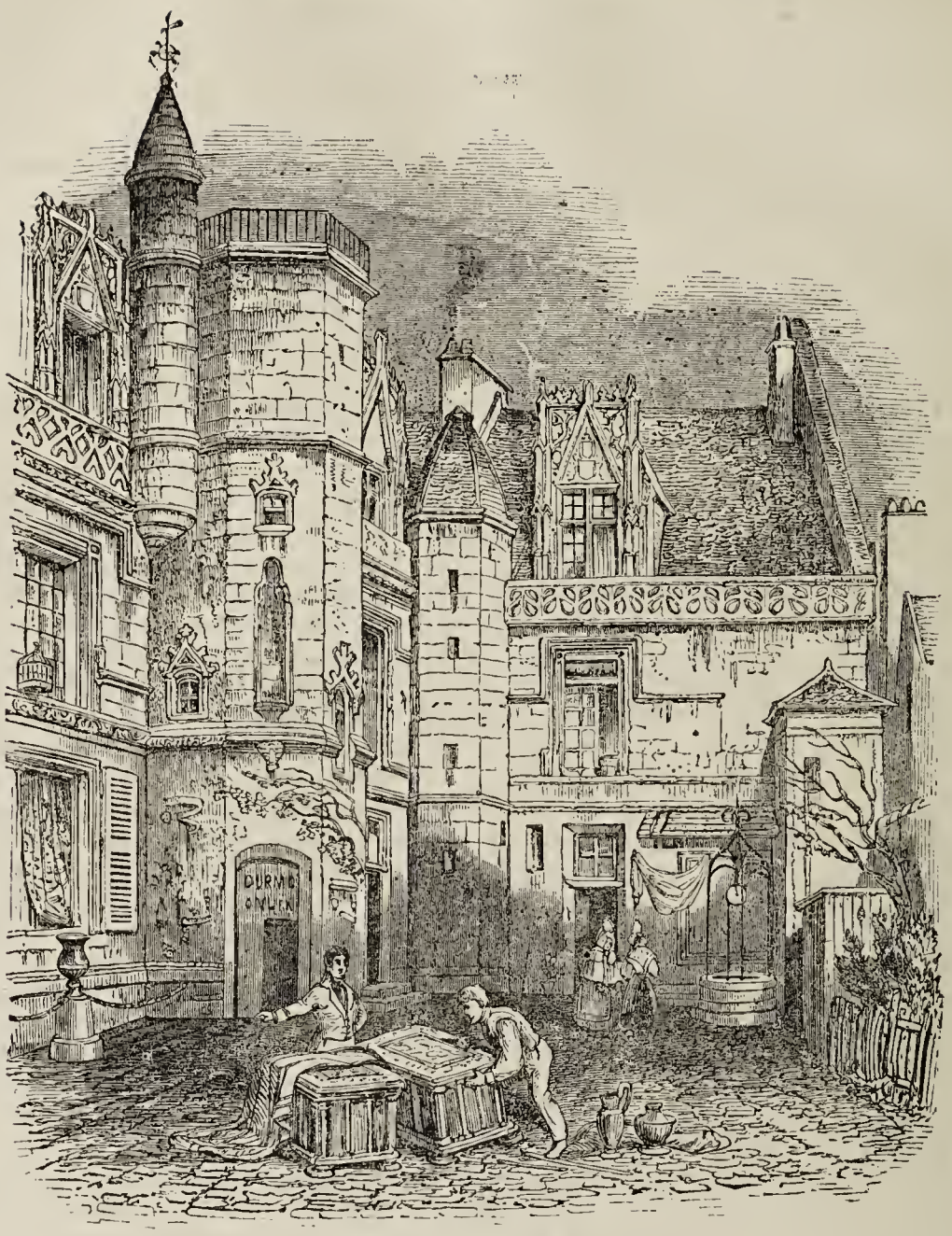
It might appear somewhat arbitrary to limit the extent of the Valley of the Tyne towards the north between Hexham and Newcastle, since there is no range of high ground by which valleys are commonly kept within certain limits. But there is the site of the ancient Picts' wall, though little of the wall itself remains; and when this remarkable barrier was first built, there seems but little doubt of its being considered as bounding the valley on that side. The distance from the river to the old wall varies from one and two to four miles. Southward the valley is tolerably well defined, for although the highlands cannot be called mountains which intervene between the Tyne and the Derwent (a large stream falling into the Tyne three miles west of Newcastle), the land is sufficiently elevated to limit the boundary of the valley. The Derwent is by far the largest stream that empties its waters into the Tyne to the east of Hexham; for a considerable distance it is the division of the counties of Durham and Northumberland, but from five miles west of Newcastle to the sea the Tyne divides the two counties.

The Valley of the Tyne has long been noted for its extensive iron-works, but these are confined to a limited district a few miles above Newcastle, where there are some populous mean-looking villages inhabited by persons employed in those works. There are also in and about Newcastle extensive glass-works, as also a few potteries, and various other branches of trade and manufactures existing; but the grand staple of this valley, from several miles west of Newcastle downwards, is coal, the traffic in which has for a long period been so extensive, that coals are familiarly called "Newcastle diamonds." This river is navigable for large ships as high as Newcastle, but most of the coals are shipped from the various railways that strike the river between this town and Shields; while merchant vessels generally load and unload at the wharfs in Newcastle. From this town to Shields (North and South Shields), seven miles, there is little that is interesting to those that are not connected with coals or the collieries; but in defiance of coals and coal smoke, Tynemouth, situated on the north shore of the river immediately below North Shields, is still frequented by persons who resort thither for sea-bathing during the summer season.

Upon the whole the soil of the Valley of the Tyne is somewhat less fertile than that of the Tees, and although there are more resident gentry in the vicinity of the former, the manufactures and commerce therewith connected give it a less agricultural character than belongs to the vale of which Cleveland forms so conspicuous a part.

Recreation for the People.—Another point which has appeared to me of great importance is to provide as many resources as possible of interest and amusement for their leisure hours; something to which they may return with renewed relish when their daily work is done; which may render their homes cheerful and happy, and may afford subjects of thought, conversation, and pursuit among them. The importance of this can only be estimated by observing the ruinous effects of the want of it—neglect of home and domestic duties—the frequenting of the public-house—contracting the habits of a drunkard, and seeking for pleasure among the vulgar amusements that brutalise their character, while they depress and impoverish their condition. But the source of the evil itself is the having nothing to do—nothing to supply that want of our nature which demands recreation after toil, as well as toil to give relish to recreation—nothing to occupy the thoughts, which insist on being occupied with *something*—nothing for him to pursue who is by nature an animal of pursuit—nothing innocently to engage the affections which absolutely refuse to be left void. This is the real evil—the foundation of the mischief. We blame our operative population because they indulge in low and vulgar pleasures. Why, they have nothing else to indulge in! Where are the innocent amusements provided for them? Where are the exalted pleasures they are invited to partake? Where are rational, virtuous, improving occupations afforded them? Where are sobriety, modesty, and good manners publicly encouraged and respected? In other countries those public places of amusement where different classes meet together in some measure, though very imperfectly, supply this deficiency.—*Mr. Greg's Letters to Mr. Horner on the Capabilities of the Factory System.*

ANTIQUITIES OF FRANCE.



[Hôtel de Cluny, Paris.]

In Paris the houses inhabited by the old nobility are generally termed hôtels, and bear the name of the family to whom they belong, or who occupy them for the time, as the Hôtel de Montmorency; and even the public buildings or government offices are called hôtels, as the Hôtel des Postes (General Post-Office), Hôtel des Monnaies (the Mint), Hôtel du Timbre (the Stamp-Office). The residences of some of the nobility in London were at one period called Inns, which has the same signification as hôtel, and several of the Inns of Court, as Gray's Inn, Furnival's Inn, Lincoln's Inn, and Clifford's Inn, were originally the residences of Lords Gray, Furnival, Lincoln, and Clifford. At the present time a nobleman's place of residence in London, if its pretensions are sufficient to distinguish it from the houses near it, is generally called after the title of its possessor, as Devonshire-house, belonging to the Duke of Devonshire, and Northumberland-house, at Charing-Cross, belonging to the Percy family. The latter will convey an idea of the hôtels belonging to the nobility in Paris; but the British Museum, formerly called Montagu-house, from being the residence of the Montagu family, is better known to a larger number of persons, and its resemblance to the hôtels of Paris is equally strong. Like them, the house cannot be seen from the street, from which it is separated by lofty walls, and visitors enter through a gateway into a spacious court or quadrangle: at the opposite end is the part containing the principal apartments, the buildings on each side serving for the domestics and other members of the household. Many of the hôtels in Paris contain within their enclosed walls an extensive garden, spacious court, stables, and offices. When the nobility kept large retinues, and Paris was often disturbed by factions, which the police was not sufficiently powerful to repress, these hôtels, resembling barracks from the number of their inmates, were characteristic of the times. Most of these relics of the middle ages are interesting from the historical events with which they are associated, or on account of the distinguished characters by whom they have been inhabited, while some are remarkable for their architecture, and others for their splendid internal decorations.

The Hôtel de Cluny, a view of which is given in the cut, is one of the most interesting hôtels in Paris. It is built in part on the site of a palace of the Roman emperors in Gaul, called the Palatium Thermarum, erected about A.D. 306, and which, from the foundations that have been traced, comprised a very large area. After the Roman domination had passed away, this palace was inhabited by Clovis, the founder of the French monarchy, who died A.D. 511, and also by several of his successors. The Roman antiquities of Paris were nearly destroyed by the Northmen during the melancholy period which preceded the accession of Hugues Capet, the founder of the third race of kings of France, who died A.D. 996; and he and his successors selected for their residence a palace which occupied the site of the Palais de Justice. In 1218 Philip Augustus gave the old Roman palace to one of his chamberlains, and about 1340, having been successively in the hands of various feudal lords and churchmen, it was sold to the abbot of Cluny; and on account of its vicinity to the college of Cluny, it was chosen as

the residence of the abbots, one of whom, Jean de Bourbon, natural son of the Duke de Bourbon, commenced the construction of the present hôtel. The undertaking was interrupted by his death, in 1485, but was resumed by the next abbot, Jaques d'Amboise, in 1490, and completed about 1505. It is in the florid Gothic style, and the finest specimen of the architecture of the period in Paris.

The château of Gaillon in Normandy, and a part of the Palace of Justice at Rouen, were erected about the same time, by a brother of Jaques d'Amboise, and exhibit the same architectural characteristics as the Hôtel de Cluny.

The widow of Louis XII., who was a daughter of Henry VII. of England, resided in the Hôtel de Cluny after her consort's death in 1515. The chamber is shown in which she was surprised by the Duke de Valois, afterwards Francis I., in company with Charles Brandon, Duke of Suffolk, whereupon he compelled her to marry the duke on the spot. James V. of Scotland also resided here for a short period after his marriage with Madeleine, daughter of Francis I. The hôtel was then in the possession of the family of Guise of Lorraine, in whom it remained until 1621. After this period, the decline of its former splendour seems to have commenced; and at the Revolution, it was tenanted chiefly by tradespeople of various kinds. Lalande, the astronomer, had made an observatory of one of the turrets; and the "section Marat," one of the fiercest and most violent revolutionary bodies of Paris, assembled within those walls in which the haughty feudal lord of a former age lived in stately pride amid his vassals and retainers. During the violent crises of the Revolution, all works of art, and religious edifices especially, became the objects of popular fury. Even the Convention set the example, and decreed that the tombs of the kings of France at St. Denis should be destroyed; and it was even discussed whether Versailles, the Porte St. Denis, and other public edifices, should not undergo the same fate; but fortunately this manifestation of opinion led a few of the more enlightened members to support a motion, which was finally adopted, to collect the moveable monuments of France, and to place them in a museum. This collection was made in the Hôtel de Cluny, under the direction of M. Alexander Lenoir, who arranged them in chronological order. When this good work was commenced, it required no small degree of courage to exhibit any feeling of regard for the monuments of the past. Both the state and individuals were also interested in the work of spoliation. The former melted the bells of the churches for coin; and the fine old abbeys were desecrated after the expulsion of the monks or pulled to pieces, and the materials appropriated by private individuals.

Little could be done by a few individuals against resistless multitudes actuated by the blindest fury and the wildest passions. Several of the great abbeys of Paris were accordingly almost totally destroyed during this period; and scarcely a vestige remains of the abbey of St. Victor, which covered twenty acres of ground. With the exception of Notre Dame, nearly all the chief buildings of the fourteenth century have disappeared. Only a few comparatively of the royal and noble monuments contained in the monasteries found their way into the museum of M. Lenoir. When the Restoration took place, and the ancient aristocracy returned with broken fortunes to France, they found their châteaux, their churches, and burial-grounds despoiled of their family effigies and monuments; and the king, while decreeing the restoration of such objects, took no sufficient precaution to ensure their falling into the hands of those who were legally entitled to them. Many of them were shovelled into carts, and conveyed nobody knew where. As a love for the past, and an interest and sympathy for the remote generations who were our progenitors, is liable to be destroyed for a time in the wild and stormy crises to which nations are subject, and in the severe trials of fortune to which individuals are exposed, so it happened with the emigrant noblesse: they had lost the sentiment of ancestral affection. The energies of France under the Republic had been directed to one object, the safety of the country and the destruction of its enemies; and under the Empire, the mania for military glory formed men's sole pursuit. During these two periods, scarcely any one thought of ought else but the great objects before them. There were, however, a few enlightened men who cultivated a knowledge of the national antiquities; but for all the rest, the past seemed scarcely to address itself to the existing generation. Happily this state of things, which characterised also in a considerable degree the early period of the Restoration, has passed away, and the study of the antiquities of the middle ages has been pursued in a philosophical spirit, and with that discernment and activity which distinguish the intellectual exertions of our neighbours. The work of M. du Sommerard, entitled 'Notices sur l'Hôtel de Cluny et sur le Palais des Thermes,' is a gratifying example of the manner in which this revived spirit of inquiry exhibits itself. M. du Sommerard occupied a part of the Hôtel de Cluny, and he has attracted universal attention to this and other buildings of the same class by interesting those who previously cared little for antiquarian remains. In the work in question he has given an account of the Roman towns of Gaul and the present condition of their antiquities; and in treating of the Hôtel itself, he has introduced the reader to a knowledge of the architecture and arts of the middle ages, the painting and sculpture, and the games, amusements, and manners of those times.

The government has now placed itself at the head of this movement, and has organised two bodies, one called the "Commission des Monuments Historiques," and the other the "Comité Historique des Arts et Monuments," and has besides instituted courses of lectures on Christian archæology.

The duty assigned to the "Commission des Monuments Historiques" is to collect documents relating to the history of all existing monuments in every part of France, and to give its opinion upon all affairs touching their maintenance and preservation. M. Montalivet, the Minister of the Interior, who appointed this committee, in September, 1837, addressed a circular letter to the prefects, requiring a list of all the most remarkable buildings in each of the eighty-six departments; and the committee selected ninety-five monuments in fifty-six departments as more particularly standing in need of the assistance of the administration, which had obtained a vote from the Chamber of Deputies of 200,000 francs for the purpose. This committee recommended that application should be made to the Chamber for a special grant for the great Roman monuments of Arles and Orange.

The "Comité Historique des Arts et Monuments," organised by the Minister of the Interior, in December, 1837, is charged with the duty of watching over and inspecting the works of art and monuments which may be classed among the antiquities of the country. The "Commission" indicates its views, and the "Comité" is entrusted with the power of carrying them into effect under the superintendence of the minister. It is proceeding to make an archæological survey of the whole of France, in which every monument of importance, amounting altogether to about three hundred, will be fully described and illustrated. Those of secondary importance will be described in a less elaborate manner. Statistical and "monographical" accounts are to be drawn up as models, to which all others will be made to conform. The arrondissement of Rheims, one of the richest in monuments, has been selected as the subject of a model-statistical account; and the model-statistical account of a great city will have Paris for its subject. The architec-

tural drawings and the historical descriptions are entrusted to eminent artists and writers. The scale of reduction and elevation fixed on is $\frac{3}{1000}$ for plans and $\frac{6}{1000}$ for views. For the subjects of the "model-monographical" descriptions of monuments, two churches of opposite characters have been selected, the cathedral of Noyon and that of Chartres, the former a specimen of a "severe and original church," and the latter the richest and most sumptuous building of the kind in France, and nearly half as large again as any other cathedral, possessing a fine series of early painted windows, which contain about nine thousand figures. The architectural drawings of this vast church are entrusted to one artist; those for the statuary to another; and M. Guizot, who was then Minister of Public Instruction, undertook to write the history of the building; while the archæological description will be written by M. Dindron, one of the secretaries of the "Comité." The drawings of the cathedral of Chartres are making on a scale of eight feet by six for the western front; twelve feet by eight for the longitudinal view and section; and the figures of the details are eighteen inches in height in their various plates. The Report of the "Comité" states that the scale of engraving for such a work as this is to be a certain multiple of that adopted for smaller buildings; and the same relative scales are to be adopted in all future monographical descriptions. A third kind of monographical account applies to edifices partly destroyed. The Committee distributed 36,000 circular letters in all the communes of the departments, and to the inspectors of primary schools, containing very succinct and precise questions relating to the Gallic, Roman, and Mediæval antiquities of France, so simple that the answers required were merely "yes" or "no." A series of manuals has also been commenced, which comprise the whole of the national antiquities under its divisions, architecture, painting, and sculpture. By these efforts the Committee expect in time to "to reduce the study of antiquity to the condition of an exact science."

The lectures on Christian Archæology, instituted by the Minister of Public Instruction, on the recommendation of the Committee, comprise Christian architecture, and painting and sculpture as they are connected with Christianity. They have excited great interest, and even enthusiasm, and the clergy are recommended to introduce similar courses in the ecclesiastical seminaries. The same minister has also commenced the foundation of an archæological library, and has given up one of the old churches of Paris for the purpose of forming a national museum of antiquities.

Such are the efforts which are making in France in a department of inquiry to which her attention has been but lately directed. We could not expect in England such energy and enthusiasm, combined with so much sound sense, upon any subject remote from our immediate interests. There is not a sufficient number of men of high taste and education to encourage each other in the cultivation of plans so extensive as those which are under the superintendence of the two bodies whose proceedings we have detailed. Even on subjects of quite another character, though still apart from money-getting, there is not that combination of effort which is indicative of energy and strength. For example, a good statistical account of England, resembling in some respects that which has been drawn up by the clergy in Scotland, would be a very valuable and important national undertaking; but the only approximation to such a work are the County Reports drawn up thirty and forty years ago, under the superintendence of the Board of Agriculture. What the French have done, and are doing, to illustrate the history of their country, should teach us to admire their mental activity and the many admirable qualifications which they possess, calculated to render their labours truly valuable.

SCALES AND WEIGHTS.—No. II.

In the former paper on this subject we treated of some of the various kinds of balances, or weighing scales, and have now to speak of the nature of the weights employed. We have hitherto merely said that certain metal weights are employed as a counterpoise to the goods bought and sold, but the determination of the sizes of those weights is altogether a different subject.

There is in reality no particular reason for employing weights of one scale of dimensions instead of another, provided those dimensions are well understood by both buyers and sellers; for it would amount to the same thing in the end whether what we call a "pound" were fifty per cent. over or as much under its present amount. The purchaser would obtain the same amount of commodity for the same price as he does now. The important part of the matter is, that when once the dimensions of the pieces of metal to be employed are fixed upon, they should remain permanent and general, so that a purchaser may know that a pound of a purchased commodity is an equal and equivalent quantity, whether he purchases at London or at York, in 1830 or in 1840. As unworthy persons might use light weights to deceive their customers, without the latter being at all times able to perceive it, it becomes necessary for the legislature to interfere, and enforce by penalty the adhesion to some particular standard of weight.

It appears that legislative enactments on this subject have been made at various times in the history of this country, the nature of some of which we will detail, as given in the Report of a Parliamentary Commission about twenty years ago.

King Edgar is said to have ordered a certain degree of uniformity in the weights of the kingdom in the year 975; but this was more completely done by a statute of William the Conqueror, in which it is ordered that all the weights and measures in the kingdom should be stamped. Richard I. caused several standard yards to be made in 1197; and it is said that this term "yard" was first applied to a measure exactly equalling in length the arm of a preceding monarch, Henry I. King John confirmed the legality of the weights and measures in Magna Charta. The first means we have of knowing the real nature of the standard of weight is by a statute of Henry III., in 1266, which declares "that an English peny, called a sterling, round and without clipping, shall weigh thirty-two wheat-corns in the midst of the ear, and twenty pence to make one ounce, and twelve ounces one pound, and eight pound do make a gallon of wine, and eight gallons of wine do make a London bushel, which is the eighth part of a quarter." Rude as this method is, we see in it an attempt to reduce coinage, weight, and measure of capacity, to the same standard. Most of the subsequent enactments related rather to measures than to weights, but as the present article is devoted to the latter subject only, we will pass over details relating to the former.

It appears that a *wheat-corn* was the first standard of weight in England, and it is supposed that the metallic weight called a *grain* became used as a representative of the wheat-corn, and that the modern troy grain is nearly the same. After a time, the pennyweight, or "sterling," was reduced from 32 to 24 grains; 20 pennyweights made an ounce, and 12 ounces one pound: this was called the *troy pound*, and became the standard of English weight, consisting of 5760 grains. But still the legislature could not ensure uniformity in the weights; for there was the moneyer's pound of 5400 grains, the avoirdupois pound of 7000 grains, and the old commercial pound of 7600 grains.

In the time of Elizabeth a standard of the avoirdupois pound was placed in the Exchequer, and standards of the troy pound were placed in the Exchequer, Goldsmiths' Hall, and in the Mint. Nothing particular seems to

have occurred with regard to the standard of weight till 1758, when a Committee of the House of Commons was appointed to investigate the subject of weights and measures. The results arrived at with respect to measures we will not here detail, but the decision as to weights we must briefly consider. On comparing the troy pound kept at the Mint with that at the Exchequer, it was found that the former was 1¼ grains heavier than the latter; and as the Exchequer pound had been in frequent use for 170 years, the Committee concluded that it had become somewhat worn, and accordingly they adopted the Mint pound. It was then considered whether the English standard should in future be the troy or the avoirdupois pound; and they resolved on the former, for these reasons: that it is "the weight best known to the English law; that which hath been longest in use; that by which our coins are measured; that which is best known to the rest of the world; that to which our learned countrymen have referred and compared ancient and modern weights; the weight which hath been subdivided into the smallest parts." The Committee then proceeded to obtain, with the utmost possible exactness, standard weights of the several parts of the pound troy, in which they were assisted by a balance constructed by Mr. Bird, which would turn with the 2000th part of a grain. One copy of the standard troy pound was delivered to the House of Commons, and another to the king's assay-master of the Mint, in whose possession also was, and we believe still is, Mr. Bird's weighing apparatus.

We now pass on to the year 1814, when a motion was made in the House of Commons to inquire into the standards of weights and measures. A Committee was appointed, who examined scientific men, and brought in a Report; on this Report a bill was founded, which passed the House of Commons, but was thrown out by the Lords. In 1816 an address was presented to the Prince Regent, praying for the appointment of a government committee to consider the whole subject in a scientific point of view. The Commissioners appointed were, Sir G. Clerk, Mr. Davies Gilbert, Dr. Wollaston, Dr. Young, and Captain Kater; and these gentlemen, after a very elaborate inquiry, particularly on the part of Captain Kater, presented three Reports, relating to different parts of the subject. Of these Reports we shall only speak of that part relating to the standard of weight. It was considered, after mature deliberation, that there was no sufficient ground for changing the standard of weight; the troy pound of 1758, kept by the clerk of the House of Commons, was therefore declared to be the standard of English weight, that it was to be deemed as containing 5760 grains, and that the pound avoirdupois should be equal to 7000 such grains. There were reasons urged why the English standard should be assimilated to that of France (of which we shall presently speak), but the Commissioners decided against it, because "it is scarcely possible that the departure from a standard once universally established in a great country should not produce much more labour and inconvenience in its internal relations than it could ever be expected to save in the operations of foreign commerce and correspondence." But in the event of the parliamentary standard being lost, destroyed, or injured, the means of regaining it were provided for thus:—A cubic inch of distilled water, at a temperature of 62° Fahr. and 30° bar., was accurately weighed, and found to be equal to 252·458 troy grains; from which it may be deduced that the weight of a troy pennyweight is to that of a cubic inch of water, in the state above alluded to, in the proportion of 24·000 to 252·458; we have therefore the means, at any future period, of producing a standard troy pound exactly equal to that constructed by Bird in 1758, and placed in the custody of the House of Commons. A circumstance was pointed out in the 'Companion to the British Almanac' for 1828, which makes the above verification totally independent of the graduation of the thermometer employed: it is this—that the temperature (62° Fahr.) at which the water has been fixed for the determination of the standards of weight and measure is one which is situated above the freezing-point, at exactly the sixth part of the distance between the freezing and the boiling points. The determination is therefore independent of the mode of graduation of the instrument employed.

The recommendations of the Commissioners were generally approved of, and two acts of parliament were passed, in 1824 and 1825, to put them in operation. But so difficult is it to eradicate early formed and long employed habits and customs, that it was found that many of the provisions of these acts were slighted, and the most heterogeneous modes of weighing and measuring still prevailed. For instance, although a hundredweight of rope contained 112 lbs., yet a hundred weight of twine, even in the same manufactory, was often considered as equal only to 100 lbs.; and a cwt. of potatoes was, under different circumstances, reckoned at 120, 126, and 132 lbs. A new act, having for its object to remove part of the discrepancies, came into operation in 1835, among the provisions of which were—that all weights used should be either of lead or pewter; that all weights verified and stamped at the Exchequer should be legal, whether their shape agree with the Exchequer standard or not; that copies of the standard weights should be provided for each county; that the stone (which had formerly been equal to 14 lbs. for some purposes and 8 lbs. for others) should be uniformly equal to 14 lbs; and that 8 stone, or 112 lbs, should form 1 cwt.

We may therefore briefly sum up the present state of things in England with regard to weight. Gold, silver, and precious stones are reckoned by troy weight, the pound being equal to 5760 grains, and being subdivided into ounces, pennyweights, and grains, a standard troy pound being preserved with great care. The more bulky commodities bought by weight are estimated by the avoirdupois pound of 7000 grains, which is subdivided into ounces, drams or drachms, and grains. Drugs, as bought wholesale, are reckoned by avoirdupois weight, but when retailed in the state of medicines, they are reckoned by the troy pound, the subdivisions of which, for the apothecary's purpose, are into ounces, drachms, scruples, and grains, instead of ounces, pennyweights, and grains. Although diamonds are in reality sold by troy weight, yet the unit measure is called the carat, equal to $3\frac{1}{6}$ grains troy. In order to reduce the weight of any substance from avoirdupois to troy, or the contrary, it will be useful to bear in mind that the avoirdupois pound is greater than the troy pound in the proportion of 175 to 144, and the avoirdupois ounce is less than the troy ounce in the proportion of 175 to 192.

We must now cross the Channel, and speak of the highly scientific system of weights adopted by the French. It will be seen that in England, notwithstanding the improvements that have been made, the standard of weight really rests on nothing more precise than that of a wheat-corn, and the standard of length on the length of the arm of one of our early kings. The French weights and measures, until the last thirty or forty years, were in principle but little better. Soon after the Revolution, the French mathematicians turned their attention to the introduction of a decimal system of notation on as extensive a scale as might be practicable. There are certain facilities in computation afforded by the decimal notation which will be easily understood by those familiar with arithmetic. In familiar language we may say, that instead of dividing a quantity into halves, quarters, half-quarters, &c., as we are accustomed to do, the decimal notation divides it into tenths, hundredths, thousandths, &c. It was proposed to introduce the decimal mode of

division into weights and measures, but it was deemed expedient first to obtain a rigorous standard of weight, of length, and of bulk, in lieu of the imperfect ones then in use. For this purpose they sought for a standard among the unchangeable works of nature, as being of more constant application than any of the productions of man. The circumference of the globe was fixed upon; for we have no reason to believe that this circumference increases or diminishes.

The distance from either pole to the equator is mathematically equal to one quarter of the circumference passing through both poles, and is therefore called a quadrant, and it was determined to make the ten-millionth part of this quadrant a standard of measure from which a standard of weight might be deduced. The next point, therefore, was to determine the exact number of toises (or any other known measure of length) equal to a quadrant of the earth's circumference. This was a very delicate operation, requiring the resources of the astronomer and the mathematician. The result arrived at was, that the distance from the north pole to the equator was equal to 5,130,470 French toises, or 10,936,578 English yards. The ten-millionth part of this quantity was taken as the standard of length, and called a *mètre*, being equal to about 39·37 English inches. From this standard were obtained not only other measures of length, but also measures of weight and of capacity, the decimal mode of subdivision being employed throughout. We will, in accordance with our plan hitherto, speak only of those arrangements relative to weight. The hundredth part of a mètre is called a centimètre. Suppose, then, that we have a centimètre cube of distilled water at its point of greatest condensation (about 39·38° Fahr.); the weight of this cube is the unit or standard of weight, and is called a gramme. By using Greek prefixes, expressions are obtained for 10, 100, 1000, and 10,000 grammes, and by the use of Latin prefixes, we obtain names for the 10th, 100th, 1000th, &c. of a gramme: thus decagramme is equal to ten grammes, decigramme equalling the tenth of a gramme, the one being a Greek and the other a Latin prefix. The silver coinage of France rests on the same basis, a franc being the weight of five grammes of silver nine-tenths pure.

This system has been found very advantageous in a scientific point of view, but the government found insuperable difficulty in persuading the trading part of the nation, particularly the humble classes, to accede to it. It is in some respects more difficult than the old system to uninformed persons, and the legislature countenanced a kind of medium system between the two, called the système usuel. In this the mètre is still the standard; but quantities are divided into halves and quarters instead of tenths, &c., and many of the old terms are used, with the term usuel annexed. The old system, employed till the end of the last century, consisted of livres, ounces, gros, and grains, and the système usuel also consists of those denominations, but they are not equivalent in value, the livre usuelle being derived directly from the kilogramme, and differing slightly from the old livre, or livre de Marc. At the present day we believe that the système usuelle is pretty generally adopted in retail transactions, except perhaps in remote country places, while the système metrique is employed for all scientific purposes.

Having thus briefly described the systems of weights employed in England and in France, we have done all that our limits permit, for almost every state in Europe has a system peculiar to itself, either in the names employed or in the value of the weights to which the names are attached: thus the Hamburg pfund (pound) is equal to 1·068 English avoirdupois pounds, and the Prussian pfund equal to 1·0311 English pounds, and probably no pfund throughout Germany exactly equals that of England; indeed, the pfunde of Germany, the pounds of England, the livres of France, and the libbre of Italy, though apparently derived from similar sources, generally differ from one another. Every country where the attempt has been made has afforded evidence how difficult it is to institute changes in the customary modes of proceeding in these matters.

Mexican Architecture.—One of the most stupendous monuments of this style of architecture was the great temple at Palenque (built, according to the bold assumption of Lord Kingsborough, after the model of that of Solomon), which comprised within its extensive precincts various sanctuaries and sepulchres, courts and cloisters, subterraneous galleries, and cells for the habitation of the priests. The whole rests on a platform composed of three graduated terraces, and forms a spacious quadrangle enclosed by porticoes. On each side of the exterior is an ascent or flight of stairs, and on the east a second flight leading down, after the first is ascended, into the cloistered court. Beneath the cloisters are what are conjectured to have been initiatory galleries; and in the centre of the quadrangle is what appears to be the ruins of an altar or 'high place.' The city of Palenque itself exhibits a variety of buildings, temples, palaces, baths, and private houses, all manifesting excellence of workmanship combined with considerable skill in design. The remains of a palace at Mitla show that it must have been an edifice of great extent and grandeur; and the walls appear to have been sculptured or tooled externally, in imitation of mat or basket work, a species of decoration characteristic of Toltecan taste, and often found in sepulchral chambers. This same building has also a portico with plain cylindrical columns, differing from any found elsewhere. In order to give an idea of the extraordinary vastness of some of these Mexican or Toltecan constructions, we may adduce the instance furnished by the great teocalli, or pyramid, of Cholula, the side of whose base is 1440 feet, whereas that of the great pyramid of Jizeh is only 763 feet. The height however is, according to Humboldt, not more than 177 feet, and as the receding terraces are very wide, and the area of the upper platform or terrace small in comparison with the area of the base, the outline of the whole would not be that of a continuous pyramid, but merely such as might be inscribed within such figure. At Teotihuacan, about eight leagues to the north-east of the city of Mexico, are an immense number of pyramids, several hundred small ones ranged in files or lines, and two larger ones consecrated to the sun and moon. Each of the latter is divided into four platforms, the slopes between which consisted of steps, and on the summit was a colossal stone statue covered with plates of gold, which were stripped off by Cortes's soldiers, and the statues themselves destroyed. Besides monuments which are chiefly works of magnificence, others exist which attest the high degree of civilization attained by the Toltecans, such as Cyclopean roads and bridges. The former of these were constructed of huge blocks of stone, and frequently carried on a continued level, so as to be viaducts across valleys. There are also throughout Central America numerous excavations or rock-hewn halls and caverns, called by the natives 'granaries of the giants.' They resemble the Cyclopean fabric near Argos known by the name of the Treasury of Atreus, are generally dome-shaped, and the central apartment is lighted through an aperture in its vault. Other points of resemblance to Cyclopean masonry may be found in the doorways to these subterraneous galleries and apartments, which are similar to the gate of Mycenæ; and also in the peculiar triangular arch formed by courses of stones projecting over each other. Arches of this mode of construction are found in the cloisters of the building at Palenque. The remains of sculpture found in Mexico are numerous, and of great variety both of form and material. Captain Vetch has described (*Lond. Geogr. Journal*, vol. vii., p. 1) a collection of stone figures in his possession, which were recently procured from the banks of the river Panuco.—*Penny Cyclopædia.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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BRITISH AGRICULTURE.

MAY.

[Agricultural Emblems of the Month of May.—Selected from Saxon Calendars in Cotton and Lansdowne MSS.]

THERE is no other month in the year so universally hailed as the harbinger of joy and gladness as is the month of MAY. It seems in our favoured isle to be the general jubilee of nature—the season when the groves and fields again put on their gay green liveries, and animal existence everywhere rejoices in that all-pervading influence which manifests itself through the whole chain of created beings.

> "The valley rings with mirth and joy;
> Among the hills the echoes play
> A never, never ending song,
> To welcome in the May.
> The magpie chatters with delight;
> The mountain raven's youngling brood
> Have left the mother and the nest,
> And they go rambling east and west
> In search of their own food,
> Or through the glittering vapours dart
> In very wantonness of heart.
> * * * *
> Along the river's stony marge
> The sand-lark chants a joyous song;
> The thrush is busy in the wood,
> And carols loud and strong.
> A thousand lambs are on the rocks,
> All newly born! Both earth and sky
> Keep jubilee." *

* Wordsworth's 'Idle Shepherd-boys, or Dungeon-Ghyll Force.'

The flocks and herds are again abroad, roaming the flowery pastures and cropping the tender herbage free and uncontrolled; while from every copse, grove, or blossoming hedge-row, is poured forth the joyous song of many a carolling warbler. The rustic ploughman too, as he "stalks a-field," whistles a blither strain, or chants some rural ditty with a heart more light and buoyant, for he feels that the pinching winter is past; and although teeming nature already begins to gladden the husbandman's heart with the favourable prospect of abundant crops at the appointed time of harvest, the sweltering heat of summer does not yet oppress him, for the genial breezes of the south are yet cooled and moistened with the showers of spring, and scented with the sweet fragrance of myriads of opening flowers.

> "'Twas at the season when the earth up springs
> From slumber, as a sphered angel's child,
> Shadowing its eyes with green and golden wings,
>
> Stands up before its mother bright and mild,
> Of whose soft voice the air expectant seems;—
> So stood before the sun, which shone and smiled
>
> To see it rise thus joyous from its dreams,
> The fresh and radiant earth. The hoary grove
> Waxed green, and flowers burst forth like starry beams;
>
> The grass in the warm sun did start and move." *

* Shelley—'Fragments.'

The rural gaieties and festivities formerly attendant upon the annual return of May—the ceremonials of weaving gay garlands of flowers to entwine and decorate the May-pole—the choosing and the installation of some rustic village beauty as the Queen of May—and even the dances on the village green—are one and all of them now nearly or wholly obsolete, and in some places quite forgotten. Indeed, in many extensive districts of country there is no longer a May-pole to be met with; and even in those counties where, in every village and hamlet, a tall tapering pole formerly might be seen, around which, during the summer evenings, the villagers would assemble—the young to dance or frolic in giddy mirth, while the older and more staid portion of the inhabitants told over the news and passing events of the day—but very few May-poles are now to be met with.

How frequently has "Oh, give me but a country life!" been sighed and responded to by those whose pursuits and occupations compel them to continue to inhale the impure atmosphere of our crowded towns and cities, but never more ardently than during the month of "rosy-fingered" May. There is one class of society, however (we have a reference to the highest and most fashionable circles), that barter the delights of the early summer month to capricious and tyrannical fashion—who, if we may be allowed the expression, turn night into day, and continue the bustle of what they denominate the town season until Midsummer is come, or probably past, before they return to their country seats and residences. For them the daisy-spangled lawn, the cowslip-gilded meadow, the hawthorn hedge-row, adorned with its numberless pink and white blossoms, that give to every passing breeze an aromatic fragrance, seem to possess no charms; neither are their hearts gladdened with the morning song of the merry lark, the softer melody of the thrush at the decline of day, or soothed with the lone and wild melody of the nightingale at the dull hour of midnight. That we are not only advocates but enthusiasts for the charms of a country life we are free to admit, but in that we are neither singular nor extravagant:—

"Bless'd land! though vernal tempests often howl,
And winter's wat'ry clouds on summer scowl;
Yet hence our brooks in even currents flow,
Nor their parch'd beds in early autumn show,
But ever full, the verdant foliage lave,
That hangs reflected o'er the glassy wave.
Hence too our trees, e'en on the mountain's brow,
In full viridity of foliage grow;
Nor mourn their shrivell'd roots and withered bowers,
When summer's suns exhale the vernal showers.
Hence too on pastures, rich in verdure, feed
The rising vigour of the martial steed:
With fatter juices make the milk-pail frothe,
And the meek sheep with warmer fleeces clothe." *

In those parts of the country where the cultivation of hops is a matter of some account with the farmers, it may be observed that now is the season when the hop-vines or bines begin to run, and therefore require the more particular attention of the husbandman:—

"Get into thy hop-yard, for now is the time
To teach Robin Hop on his pole for to climb;
To follow the sun, as his property is,
And weed him and trim him, if aught go amiss
Grass, thistle, and mustard-seed, hemlock, and bur,
Tine, mallow, and nettle, that keep such a stur,
With peacock and turkey that nibble off top,
Are very ill neighbours to seely poor hop." †

Although most writers on the cultivation of the hop recommend a rich, deep, mellow, dry soil, rather inclining to sand than clay, yet in the Wealds of Kent and Sussex many of the hop-gardens (as the farmers usually designate their hop-grounds) are to be found on spots where the soil has originally been of a moory or somewhat boggy nature, but which, by the means of draining and ditching, has been reclaimed, ameliorated, and laid dry. Such plots of ground are commonly met with in low and sheltered situations; and notwithstanding that it is highly desirable that hop-grounds should be so situated as to enjoy the full advantage of the warm rays of the summer sun, yet, as an elevated exposure renders the plants, while young and tender, liable to serious injury from strong winds, and later in the season, when the vines have environed the tall poles and loaded them with a mass of luxuriant foliage, they are frequently blown down and broken, situations that are not so much exposed to the storm and tempest are generally preferred.

"Ground gravelly, sandy, and mixed with clay,
Is naughty for hops, any manner of way;
Or if it be mingled with rabbish and stone,
For dryness and barrenness let it alone.
Choose soil for the hop of the rottenest mould,
Well dunged and wrought, as a garden-plot should;
Not far from the water (but not overflown),
This lesson well noted is meet to be known.
The sun in the south, or else southly and west,
Is joy to the hop as a welcomed guest;
But wind in the north, or else northerly-east,
To hop is as ill as a fray in a feast.
Meet plot for a hop-yard once found as is told,
Make thereof account as a jewel of gold;
Now dig it and leave it the sun for to burn,
And afterwards fence it to serve for that turn." *

When new hop-gardens or plantations of hops are first made, the ground should be stirred to a considerable depth during the autumn, and afterwards all the weeds, stones, and rubbish completely eradicated, and the soil reduced to a fine tilth. The usual season for planting is, according to the state of the weather, from the early part of March to the middle of April. Some persons, however, prefer the autumn—about the month of October; but at that season there frequently is some difficulty in procuring a sufficient stock of plants, which are only to be had in abundance where some old hop-garden is being dug up, since the proper plants are the cuttings from the younger shoots of the roots and branches of the old standards or stocks.

During the first season the newly-planted hop-ground makes but little show; the vines or young shoots are weak, and do not attain to any great height, so that poles are considered unnecessary until the following season, the custom being to twist them around each other some time during the early part of summer, and when thus twisted, to lay them on the hills that had previously been raised where the hops were planted. They require, however, considerable attention, for the weeds have to be kept down, the plants cleaned and carefully hoed, and some fine mould or compost distributed in the hills; and where there are failures, new plants have to be inserted, in order that the hop-garden, when in full bearing, should be as full, complete, and perfect as possible.

In the beginning of March, or sometimes in the latter part of February, in the second year, when the weather is favourable, the young hop-garden has to be carefully gone over; all the hills have to be examined, and the last year's vines or shoots have to be cut off within an inch or two of the original cuttings that were planted, when the plants are afterwards to be covered over with fine earth or compost. After this process has been judiciously performed, the next thing to be done is the insertion of three or four poles, as the case may seem to require, in each hill, and so firmly as to ensure their not being blown down by the wind; but during the second year, as the hop-vines do not yet attain their full growth nor yield a full crop of hops, poles of ten or eleven feet in length will commonly be found quite sufficient. In the third year, when the plants may be considered as having attained their full size, some kinds of hops (for there are several varieties) will require poles that stand fifteen or sixteen feet high: but it should be observed, that too

* R. B. Knight's 'Landscape,' b. iii.
† Tusser's 'May's Husbandry.'

* Tusser's 'June's Husbandry.'

long poles may be used, where the ground is not rich nor the plants luxuriant, for under such circumstances the vines would be induced to impoverish themselves by running to too great an extent, in which case the blossoms would be poor and the crop of hops scanty.

We shall not at present extend our observations upon the general culture of the hop. It may, however, here be remarked, that amongst all the general crops cultivated by the farmer, the profits arising from hops is the most uncertain and fluctuating, since the quantity yielded by most hop-grounds varies very considerably from year to year; whilst the prices that hops command in the market are fully as changeable and irregular.

> "The hop for his profit I thus do exalt.
> It strengtheneth drink and it favoureth malt
> And being well brewed, long kept it will last,
> And drawing abide, if ye draw it not fast." *

As it is during the month of May that country dairying, that is, the manufacture of both butter and cheese, may be considered as coming into full operation, this appears a fit opportunity to bestow some attention upon so interesting a subject and one so immediately connected with agricultural pursuits. In populous communities, where a constant supply of milk is in demand during the whole year, the cowkeepers and dairymen are under the necessity of procuring cows newly calved, from time to time and at all seasons, in order to meet the demand; but on most dairy farms in the country the best managers contrive to have their cows calving in the spring, so that there may just be time to get the calves weaned or fattened before the cows are turned out to pasture. It is only in some particular districts that the attention of the farmer is exclusively directed to dairying; and even as regards dairies there are other considerations besides the making of butter and cheese, for the skimmed-milk and the butter-milk in one case, and the whey in the other, enable the farmers to rear a number of calves, or to maintain a still greater number of hogs and pigs. The English people are proverbially fond of cheese; few other nations consume near so much, and hence the demand is so great, that we have long been in the habit of importing considerable quantities from foreign countries, particularly Holland and the Netherlands. It is not, however, for any peculiar excellence that we import Dutch cheese, as it is far inferior to several sorts of our own, for the best quality of English cheese is probably hardly equalled by that of any other country. We likewise import large quantities of butter, because, as is the case in regard to cheese, the home supply is not equal to the regular demand. From Holland we import butter as well as cheese, but we are also supplied with large quantities from Ireland; and although a good deal of the Irish butter is of a very inferior description, it must be acknowledged that some of the Irish dairies produce butter of a quality that cannot be excelled.

Notwithstanding the almost universal manufacture of cheese of one quality or another, and in larger or smaller quantities (for there probably is not a county in the whole island of Great Britain in which some cheese is not made), there are nevertheless particular districts and localities that, more than any other, are noted for the cheese produced there. The space we can conveniently devote to this subject will allow us to introduce but a limited notice of the principal cheese-making districts, so that we will confine our observations to a few of those that appear to have acquired the highest reputation in the consuming marts, the populous towns and cities, and particularly in our hungry and ever-craving metropolis.

In order to avoid being considered as evincing an undue partiality for the cheese manufactured in any particular county or district, we will give a short alphabetical list of the kinds most generally known and inquired for, which will stand as follows, namely: Cheddar, Cheshire, Derby, Gloucester (single and double), Lancashire, Stilton, Suffolk, and Wiltshire. But before we proceed to say a few words respecting the different sorts of cheese, or rather the cheese coming under different names, some notice appears desirable respecting the prevailing opinions that exist as to whence it is that the superior quality of the cheese is derived, or to what it is mainly to be attributed; for opinions vary so materially even upon this point, that this or that opinion can hardly be called general. Some persons are of opinion that the quality of the cheese materially depends upon the nature of the pasture where the cows feed, appearing to suppose that some peculiar herb or herbs may impart a richness and flavour to the milk of the cows, and hence the cheese will partake of the like superior qualities; for most persons are well aware that herbs or plants of a peculiar or powerful taste or odour, when eaten by cows, impart something of their taste and smell to the milk: thus wild garlic will impart both taste and smell to milk when cows are fed in pastures where it grows, though they eat of it but in very small quantities. But the common grasses that we usually find in most pastures, and upon which cattle most generally feed, impart no peculiar taste or smell to the milk; neither are such grasses and plants so numerous as to vary greatly between the pastures in one part of the country and those of another part, since several of them are indigenous and common to the pastures of every district of country in the kingdom. It therefore is scarcely probable that the quality of the cheese can mainly be attributed to the nature and quality of the grass upon which dairy cows pasture, but rather upon the quality of the milk (since the milk of cows varies greatly in richness) and the means afterwards adopted in the process of cheese-making. The quality of milk has been ascertained to depend materially upon the particular breed of the cow, the length of time from calving, the supply of pure water, the nature of her food, and some other matters of minor consideration. As general and necessary points in the management of the dairy, it may be observed that the cows should be milked at regular stated hours, when great care should be taken that their udders are perfectly emptied, else the quantity of milk will be diminished and its quality in some measure affected. When the weather is hot and sultry, they ought not to be chased or over driven; and in order to induce them to feed greedily (without which a regular and copious supply of milk cannot be expected), their pasture should be changed as frequently as circumstances will allow. But this can only be effected upon tolerably large farms, otherwise the enclosures would have to be of a size inconveniently small.

Mr. Lawrence and some other writers upon matters connected with dairying strongly recommend the breed of cows so well known under the name of "Suffolk Duns," as combining many of the most essential requisites for ensuring profit to the farmer, among which may be mentioned the large quantity as well as excellent quality of the milk yielded by cows of this breed. It is therefore evident that the fault does not rest with the Suffolk cows that the cheese made in that county is held in such low estimation in every part of the country; to prove which we need only quote the poet who thus characterises the cheese of his native county:—

> "What can be its boast?
> What but the common virtues of a post!
> If drought o'ertake it faster than the knife,
> Most fair it bids for stubborn length of life,
> And, like the oaken shelf whereon 'tis laid,
> Mocks the weak efforts of the bending blade;
> Or in the hog-trough rests in perfect spite,
> Too big to swallow, and too hard to bite."*

* Tusser's 'June's Husbandry.'

* Bloomfield's 'Farmer's Boy.'

The village of Chedder, from which Chedder-cheese derives its name, is situated in Somersetshire, at the foot of the southern range of the Mendip Hills, and near to the marshes that lie towards the south, extending nearly all the way to Glastonbury; but when the reputation of Chedder cheese was probably greater than it is at present, the cheese made through an extensive range of the county of Somerset was mostly sold under the name of Chedder. It formerly was the custom—and a very inconvenient one, we should suppose—for three or four of the dairies to unite their milk, and so make one large cheese; and though this custom is almost entirely laid aside, it probably originated the idea with the farmers of a neighbouring parish, who one day last summer drove the whole of their cows to a place previously fixed upon, where they were milked, and the milk afterwards converted into a cheese of immense size (estimated to weigh over half a ton) in order to present it as a present to our most gracious queen. There does not appear to be anything remarkable in the pasturage around Chedder, or indeed in any of the neighbouring parishes, where for the most part the ground is low, and rather inclined to be marshy, and at times overflowed. It is stated in the 'Library of Useful Knowledge,' under the head of "Management of Cattle," that the "celebrated Bridgewater cheese is made in the marshes between that town and Cross. Huntshill, South Brent, and East Brent are the three prime cheese-parishes." . . . "The land is rich and cool, and the pasturage not only old, but principally consisting of blade-grasses, with few flowers or odoriferous herbs to raise or produce that essential oil which is so detrimental to the manufacture of cheese." . . . "The present dairy-cow of this district is either entirely red, which shows her Devon origin; or red with a white face, which marks the Hereford cross; or spotted red and white,—and these last are generally preferred as the best milkers. They spring from the Durham blood on one side, and the farmers of this district are much indebted to the late Mr. Stone, of South Brent, who, at a considerable expense, introduced several bulls of the Durham breed."

Having thus noticed the cheese in a district of Somerset, we will next refer to that produced in an adjoining county, and known under the names of *single* and *double* Gloucester, the latter being generally considered as equalled by few, and scarcely excelled by any cheese that finds its way to the London market. Among the districts most noted for the excellence of their cheese in the part of the country here referred to, the Vale of Berkeley has long stood pre-eminent; but it has never been clearly defined to what it is that the superiority of the cheese produced here ought chiefly to be attributed. Certainly the peculiar breed of cows is not the influencing cause, for various breeds are often found on the same farm, while there are other dairies where cheese of an equal quality is produced from a stock of cows of an entirely different breed from the former. However, the cows are well attended to; the pastures are mostly old and good, while most of the farmhouses are as conveniently situated as possible, the pasture-ground surrounding them on all sides, so that the milk is but little disturbed prior to its being put with the rennet into the cheese-tub.

The mode of making the ordinary sorts of cheese does not materially differ, or at least in a much smaller degree than the qualities of the several kinds of cheese; so that, if we give a concise account of the usual process which is pursued in making *double* Gloucester, we hardly need to introduce the process which is followed elsewhere. Milk, when extracted from the cow's udder, is of a temperature something exceeding 90°; and when set, as it is termed, that is, when the rennet is introduced to the milk in the cheese-tub, the temperature should be about 85°; and that, if practicable, without the addition of milk that has been artificially heated. The matter used to impart colour to the cheese is inserted along with the rennet; after which the tub should remain uncovered until the curd is formed. After the curd has been cut to pieces, for a peculiar sort of knife should be employed, lest by breaking it with the hand some of the fatty matter should be squeezed out of it, it is then put into the vats and pressed pretty well until the whey is most of it out. The vat is filled as closely as possible, the cheese-cloth being placed over all, when a little hot water is poured over the cloth to harden the outside of the cheese. The curd is then turned out into the cloth, which is carefully folded over it, when the cheese is again returned into the vat for the purpose of being put into the press. Where there are many vats filled at once, they are all placed one upon another and subjected to the action of the same press, where they remain twenty-four hours, during which dry cloths are occasionally applied. In many dairies they adopt the plan of breaking the curd a second time; which, after being reduced as fine as practicable, is scalded with a mixture of water and whey. Although this may give a soft and uniform substance to the cheese (for which Gloucestershire cheese is so much noted), those opposed to this process are of opinion that the scalding and washing must necessarily extract a portion of the oleaginous part of the cheese. Be this as it may, we repeat that the uniform smooth and rich substance is one of the chief merits of the celebrated double-Gloucester cheese. At the expiration of twenty-four hours the cheeses are rubbed with salt, which operation is repeated for three or four days; when the cloths are finally removed, and the cheeses subjected to the press for a few days more, the length of time depending on the temperature of the weather and the size of the cheeses. They are then placed upon shelves, and turned twice a day for a few days, and then once a day for about a month, when they are clean scraped, and painted with annatto. Afterwards they are turned once or twice a week, until the season for selling arrives.

Single-Gloucester is sometimes made of skimmed milk, or of equal portions of skimmed and unskimmed milk, or occasionally of two portions of skimmed to one of unskimmed; hence it varies in quality very greatly, probably more than any other cheese that finds its way to the general markets. The greater portion, however, of the single-Gloucester that is to be met with among cheese-factors is decidedly superior to ordinary skimmed-milk cheese, though considerably inferior to the cheese generally made from *new* milk. In point of shape they are usually thinner than most other kinds of cheese.

We cannot afford space to notice the process pursued in the manufacture of Cheshire cheese; but the quality of this celebrated production is so generally known, that no praise of ours could add to its present high reputation. Indeed Cheshire cheese has long been in high repute, since Fuller, in his 'Worthies,' says, "This county doth afford the best cheese for quantity and quality, and yet their cows are not, as in other shires, housed in the winter; so that it may seem strange that the hardiest kine do make the tenderest cheese. Some essayed in vain to make the like in other places, though from thence they fetched both the kine and dairy-maid; it seems they should have fetched their ground too, wherein is surely some excellency in this kind, or else so good cheese will not be made." More modern writers attribute the peculiar flavour of the Cheshire cheese to the abundance of the saline particles in the soil of the county; and Dr. Campbell, in his 'Political Survey,' says, "That where the brine-springs most abound, the cheese is esteemed to be of the most superior quality:" however, this opinion is not generally credited.

Probably the most celebrated cheese that our island produces is the Stilton, for it not only commands the highest price in the market, but among the middle and

lower classes is looked upon as a sort of luxury. Though it has long been known as Stilton cheese, it is somewhat singular that none of it was originally manufactured in the vicinity of that town, for it was first made at Wimondham, in the Melton quarter of Leicestershire. "Mr. Paulet," says Marshall, "who resided at Wimondham, a relation of Cooper Thornhill, who formerly kept the Bell, at Stilton, in Huntingdonshire, on the great north road from London to Edinburgh, furnished his house with cream-cheese, which, being of a singularly fine quality, was coveted by his customers; and through the assistance of Mr. P., his customers were gratified, at the expense of half a-crown a pound. In what country this cheese was manufactured was not publicly known, and hence it obtained the name of Stilton cheese. At length the place of producing it was discovered, and the art of producing it learned by other dairy-women of the neighbourhood. Dalby first took the lead, but it soon made its way to almost every village in that part of Leicestershire, as well as in the neighbouring villages of Rutlandshire."

The cows that at present supply the dairies where the Stilton cheese is made, are mostly 'long-horns,' or a mixed breed between the Lancashire cattle and the Durham 'short-horns.' The cows that supply the Derbyshire dairies are of the long-horned sort (though many Durhams have been introduced of late), but of a character somewhat differing from the original Craven breed, the Lancashire of the present day, or even from the 'Bakewells,' or *new* Leicestershire cattle. We mention these matters for the purpose of illustrating the fact, that the quality of the cheese produced in various parts of the country materially depends upon other causes in connection with the peculiar breed of cows from the milk of which the cheese is produced.

The quantity of cheese annually made on some of the best dairy-farms averages from two and a half to four hundredweight per cow. It has been ascertained that the number of cows kept in Cheshire somewhat exceeds 90,000; so that, taking the quantity of cheese produced by each cow at the lowest average, this county alone appears to yield the immense quantity of 11,250 tons a year! Respecting the cheese made in Lancashire and Wiltshire, we only need remark that the best cheese produced in the first-named county greatly resembles but is somewhat inferior to that manufactured in Cheshire, while the latter very much resembles and is scarcely inferior to the double-Gloucester.

Formerly it was the custom in many parts of the country to milk the ewes, particularly after weaning the lambs, when the milk for the most part was converted into cheese. This custom, however, is now nearly extinct from one end of the island to the other; for even in Scotland 'the ewe-milking,' once the burden of many a pastoral ditty, is but very little practised, and that in only a few particular localities. Thirty or forty years ago we remember when ewe-milk cheese was not only common in Scotland, but even in some of the English markets it then might be met with. It did not, however, appear to be a general favourite, being pungent and strong-flavoured; so that when it became the emulation of agriculturists to improve the breed of farm-stock generally, in order to effect this among sheep it was found not to be a good plan either to half-starve the lambs by robbing them of a portion of the milk of their dams, or to impoverish the ewes by continuing to milk them after the lambs had been weaned. In Tusser's time—the latter part of the sixteenth century—ewe-milking seems to have been quite common, at least in those counties to which his practical notices more particularly apply, namely, Essex, Suffolk, and some of the counties adjoining; for he says—

> "At Philip and Jacob,* away with the lambs,
> That thinkest to have any milk of their dams:
> At Lammas leave milking, for fear of a thing,
> Lest (requiem eternam) in winter they sing.
> To milk and to fold them is much to require,
> Except ye have pasture to fill their desire;
> Yet many by milking (such heed they do take),
> Not hurting their bodies, much profit do make."

* St. Philip and St. James's day, May 1st.

It cannot be wondered at, when such were the customs among sheep-farmers, that the breed of sheep of those days was greatly inferior to what it is at the present. May-day is some months too early to wean the lambs (unless under peculiar circumstances), and where the ewes were not only folded at night, but after the lambs had been weaned, continued to be milked during the summer season, it was not to be expected that they should have attained a high state of condition.

The Arabs, as well as the Eastern nations generally, still continue to make both butter and cheese from the milk of their ewes and goats. The butter, however, that ewe-milk yields is of a soft and oily nature, and by no means palatable, and altogether greatly inferior to that made from the milk of cows. M. de Brisson, in the remarkable account of his captivity among the Arab tribes of Africa, says, "When the butter which is obtained from the sheep and goats, and the camels' milk mixed, is skimmed, they put it into small skins, where it acquires a rancid smell, which, according to the taste of these barbarians, greatly enhances its value. The women use it for pomatum for their hair, and without this they would think something deficient in their dress."

The consumption of butter is probably more general even than that of cheese; for while the manufacture of the latter upon a large scale is in a great measure confined to certain counties or districts of country, butter-making is more or less pursued upon nearly every farm in the United Kingdom; and there are numerous instances where the families of cottagers manage to keep a cow, the milk and butter obtained from which assist materially in the family's maintenance. From the peculiar nature of butter being less portable than cheese, and unless salted, soon liable to become tainted, most of the larger towns and cities, and populous communities generally, are supplied from the surrounding neighbourhood. When the demand much exceeds the supply, it is, however, often packed in boxes and transported by canals or otherwise to a very considerable distance. But the very best summer butter loses most of its fine flavour in a few days; hence the desirableness of having a constant and frequent supply always at hand. The London market is supplied with this article from various parts of the country; from the counties adjacent, with that which is fresh, and from the more distant districts, with salt or firkin butter. In the manufacture of butter an equal degree of skill is not probably requisite as in cheese-dairying; but nevertheless, in order to have butter of the finest quality, it is necessary that the herbage should be sweet, and altogether free from rank weeds and noxious plants. The cows should be supplied with an abundance of pure water; a cool and roomy dairy-house should be conveniently situated; and great order and cleanliness should reign in every department connected with dairy-farming.

The practical and systematic farmer, notwithstanding the regularity to which the business of his farm is subjected, owing to the irregularity of the seasons, and the stated periods for every department of farm labour, occasionally finds it against his interest to keep in employment the number of labourers for whom he at other times has plenty of work. Even during the month of genial May, when the preceding month has been a favourable one for spring work, this is far from being one of the busiest of the year; since what may technically be called the business of spring is nearly over by the earlier part of this month; though the plough is still kept pretty constantly employed, for, in addition to the fallow-lands, the turnip-ground has now to be got into a

state of readiness for sowing; though in most parts of the country the seed is not sown before the first or second week in June.

It must be here understood that the common sorts (for there are several varieties) are referred to, for when the season is favourable the farmers commonly find the middle or 20th of May the best time for sowing Swedish turnips; since if they are sown much earlier they are very apt to run to seed; and if much later, they seldom succeed so well. In some parts of the country, instead of sowing the seed of the Swedish turnip earlier than the common ones, the farmers provide themselves with plants from beds sown early in the spring, and having got their ground ready, transplant out their Swedes in this way, at a period even later than that of their common turnip season. This plan is not, however, generally to be commended, but it answers where the early sown crops may have failed, or where it has not been convenient or practicable to get the land ready at the usual season.

In the colder and later districts potato-planting is not completed before the middle of May; and where the mangel-wurzel is cultivated, that valuable crop has to be hoed and attended to, as also have the carrot and cabbage crops. Under the old system of agriculture, particularly in the dale districts, the barley seed-time took place in the latter part of this month or the beginning of June; and if the summer proved not unfavourable for the ripening of the crops, the farmers expected to reap them in August. There was an old adage among these farmers to the effect—"that barley ought to be twice in the sacks in eleven weeks." But this was at the period when barley-bread was in common use in many parts of the country; and the recently cut barley was considered as making the best barley-bannocks. The districts where barley-bread was once so generally consumed were never noted for producing that grain of a good quality, for it was mostly of the four-rowed sort, commonly called 'bigg.' Besides what was intended for bread, it used to be the custom for the farmers to have a moderate quantity annually converted into malt, to accomplish which most of the small grist-mills had malt-kilns attached to them for the purpose of accommodating their regular customers. But when it became necessary for the state to impose heavy duties upon malt, this custom in a measure ceased, and the consequence was that the quantity of home-brewed malt liquor became greatly diminished, and in many instances entirely disappeared.

There is a species of farm produce which was once pretty generally cultivated in many parts of the country, but which at present can hardly be reckoned as coming within the general products of our farms, that we will here notice, since the proper time for sowing it is during the latter part of the present month: we allude to buckwheat, or *polygonum fagopyrum*.

> "In May is good sowing thy buck or thy brank,
> That black is as pepper, and smelleth as rank;
> It is to thy land as a comfort or muck,
> And all thing it maketh as fat as a buck.
>
> Sow buck after barley, or after thy wheat,
> A peck to the rood (if the measure be great),
> Three earths see ye give it, and sow it above,
> And harrow it finely, if buck ye do love."*

Buckwheat, or brank, as it used sometimes to be called, is at present so little cultivated, that but few of our farmers are acquainted with it except by name; hence we will here introduce a short description of it. Though it used generally to be considered as a sort of corn, properly speaking it is not so, nor does it even remotely resemble any of the esculent kinds of grain. It possesses this peculiarity, however, that it will thrive in almost any soil; even on barren sands it may be raised where no other sort of grain will grow: but upland light and dry soils seem to suit it the best. The plants will sometimes attain the height of two or two and a half feet; the leaves while young are of a roundish form, but afterwards attain the shape of the leaves of the ivy, but are remarkably soft. The stalks are hollow and weak, generally green, but sometimes inclining to red. Each plant throws off many collateral branches, all of which bear numerous flowers of a very light purple colour approaching to white. The seed, when fully ripe, is of a triangular shape, nearly black, and very much resembling beech-nuts, but considerably smaller. Though Tusser complains of its rank smell, when the summer breeze passes over a field of blossoming buckwheat an aromatic fragrance is imparted to it—not so powerful as that of a field of blossoming beans, but one that is far from being rank or disagreeable. The blossoms are peculiarly attractive to bees; and in countries where the farmers cultivate whole fields of buckwheat, the bee-keepers are in the habit of sending their hives to those fields during the time the plants are in flower, commonly part of July and August, during which the bees are unceasing in extracting sweets from the pale blossoms, the honey produced in this way being much esteemed, particularly for its pure transparency. On many parts of the Continent buckwheat has long been cultivated for household use; and at one period it was so generally grown in France, that in other countries it frequently went by the name of *French* wheat. But in England it never seems to have been in common use for bread or cakes, nor considered among the esculent kinds of grain; for it was either cut in a green state and given to milch cows; or being permitted to ripen, its seed was used to feed poultry or hogs, though occasionally mixed with oats in the place of beans, and given to horses. At other times it was, and very advantageously, we are induced to believe, when in its fullest bloom, ploughed under in order to act as a manure, the stalks and leaves being of so succulent and tender a nature that, when buried under the furrow, they require but a short period before they become totally decayed. From our own knowledge of the advantage of raising buckwheat crops in other countries, we cannot but express our surprise that the culture of it is so little attended to in this country. On poor sandy soils, in parts of the country so situated as to make ordinary manures scarce and dear, probably a better mode could not be hit upon for improving their condition than that of sowing them with buckwheat, from April to August according to circumstances, and afterwards ploughing in the crop at the most favourable opportunity. In North America, in our own colonies, but more particularly in the eastern and northern parts of the United States, this species of grain is extensively cultivated, and generally found to be a prolific crop. There, however, it is greatly esteemed by the inhabitants when ground fine and made into cakes, particularly during the winter season. The flour is mixed with water until it forms a batter of moderate consistency, when it is left to ferment a little, but not to become actually sour, and then it is poured upon the griddle somewhat like pancakes, or rather resembling the cakes made of oatmeal in Lancashire and some of the adjoining districts, and commonly called 'riddle-bread.' In the interior of the country, in most of the settlers' houses, that is, during the cold weather, the vessel containing the batter for these cakes, and the griddle on which to bake them, may be seen in a corner of the fireplace from one week's end to another, the custom being to have hot cakes morning, noon, and night. But buckwheat cakes are not confined to the rude domicile of the poorer or more rustic part of the community, since the hotel and tavern keepers in the towns and larger villages find buckwheat cakes in constant demand while the cold season continues; and indeed there are few American families that do not patronise them, when they have an opportunity of getting them. When properly made, they

* Tusser's 'May's Husbandry.'

are full of eyes and spongy, something like our crumpets; and the most popular mode of eating them is to have them brought to table as hot as possible from the griddle, when they are to be well buttered; to which is commonly added fine honey in the comb.

Besides the food that buckwheat thus supplies to the inhabitants of those countries, vast quantities are used for hogs, cattle, poultry, &c.; but though swine can be fattened upon buckwheat meal, for they eat it greedily, the pork is found to be soft and oily; hence it is the almost invariable custom among those who fatten hogs, during two or three weeks immediately before their being slaughtered, to change their food from buckwheat to Indian corn, than which there is probably no grain in any part of the world that makes the pork or bacon fatter or harder or of a superior flavour. When buckwheat is allowed to ripen, the straw is nearly worthless. In America it is usually thrown upon the dunghill; since nothing short of absolute starvation will induce cattle to feed upon it. Inferior soils will commonly yield thirty or thirty-five bushels per acre, without a particle of manure, and with very little tillage or attention.

There is another sort of farm produce—for we can scarcely call it grain—that we will shortly notice, for we entertain a somewhat similar opinion respecting it that we do of buckwheat, namely, that were it more cultivated in particular parts of this country, the farmers would find it to their advantage; we refer to millet, of which there are a few varieties. The same may be said of millet as regards buckwheat, that is, it is now much less cultivated than it was formerly, and much less amongst us than it is in some of the continental countries, where it is not only given to farm-stock, poultry, &c., but is ground into meal and used for household purposes. A writer* in the 'Museum Rusticum' says—"What grain is there which, in the open field, will yield a return of one hundred and fifty for one, and which at the same time will sell so well, for in price it is on a footing with wheat? It is true it yields a heavy, crumbly, and indifferent bread, but if it is made into pottage, it is very excellent, very nourishing, and of exquisite flavour. Not only M. Tschiffeli's servants and workmen were very fond of millet thus prepared, but he himself prefers it to the best rice." The same writer goes on to say that it does not impoverish the soil, but this, from the nature of the plant, we consider a very doubtful case, since it strikes its roots deep into the ground, and produces a large quantity of straw. On indifferent soils millet will sometimes yield upwards of fifty bushels of seed to the acre, though this of course may be considered a large crop. When permitted to ripen, the straw is greedily consumed by cattle; and when cut in a green state, there is hardly any species of artificial grass upon which farm-stock feed with greater avidity. As it is so rapid of growth, sometimes growing three and a half or four feet high in a couple of months, it thus affords a most luxuriant crop for stall-feeding, such as is not to be surpassed. Probably the chief reason of its being so little cultivated in this country is owing to the opinion that generally prevails of its being a great impoverisher of the soil. But opinions amongst agriculturists are not always based upon the surest foundations—a long practical experience backed by scientific knowledge; so that when we find millet still maintaining its high repute in countries where it has long been cultivated, we cannot help wishing that more practical knowledge had been brought to bear upon the subject in this country. The millet commonly cultivated was originally brought from India; but there is a larger sort that we occasionally meet with, which was introduced into Europe from Africa.

There are two other agricultural products that once were cultivated in this country to a much greater extent than they are at present; we refer to flax and hemp. In our island the cultivation of flax has long been falling off, until, at the present day, it may fairly be considered as one of those crops that do not materially interest the farming community. With respect to Ireland the case is different, for there the concentration of the linen manufacture renders the cultivation of flax a matter of more importance. In the grazing districts in England, on many farms may still be seen the remains of holes or pits wherein the farmers were wont to steep their flax, and many a hoary octogenarian remembers to have witnessed in his boyhood the then ordinary operations of steeping and rotting flax. Long before the cotton manufactures had so very greatly encroached on the linen trade, the cultivation of flax had begun to fall off; for the farmers discovered that more profitable crops could be raised in its place, and the farmers' wives and daughters preferred spinning the better dressed flax imported from foreign countries. For several years subsequent to the period alluded to, most families resident in the country continued to spin annually as much imported flax as supplied them with linen, and that without neglecting their household duties; but in consequence of the improvements in machinery connected with our manufactures generally, and hence the cheapness of both cotton and linen goods, family flax-spinning was almost wholly laid aside in all parts of this country. In the sixteenth century spinning seems to have been one of the employments of the morning, as in later years the spinning-wheel was more commonly set going in the afternoon, and particularly during the long winter evenings, or after supper; for Tusser, in his 'Huswifery's Morning Works,' says—

> "Good husband without it is needful there be,
> Good huswife within was as needful as he.
> Cast dust into yard,
> And spin and go card."

It was the custom in some of the southern counties to sow a portion of the flax-seed during the autumn, and the remainder in the spring; but although many were of opinion that the seed yielded by the autumnal sowing was superior to the seed of that sowed in April, the fibre of that plant was allowed to be somewhat inferior. Notwithstanding that the cultivation of flax has fallen off so greatly, we still import large quantities of flax-seed, as well as of the cakes (oil-cakes) made of the compressed seed, much of the latter being used in the fattening of farm-stock.

Flax grows best upon loamy soils, particularly those that border upon rivers and streams, though, if the seasons are not too dry and the soil reduced to a fine tilth, it may be grown upon higher grounds with a fair prospect of success. With regard to the culture of hemp, we may observe, that the best situation for it is upon soft and rich loams, particularly alluvial meadows, or where occasional overflowings deposit rich vegetable matter. The cultivation of hemp has long been considered of so much importance to the welfare of the state, that the British legislature has at different periods offered premiums in order to encourage its culture, not only in this country, but in several of our colonial possessions, particularly those of North America, we requiring so large and constant a supply of cordage in our marine and naval departments. The offered premiums have not, however, succeeded in extending its growth in this country; not that we cannot grow it here, but during times of peace we can import it from Russia and other countries at a price so much below what our farmers can produce it for, that they cannot of course be expected to cultivate it as a general crop. Being a much tenderer plant than flax, it requires to be sown later in the spring, commonly during May, and although the seed does not immediately spring up, its growth is so rapid afterwards, that it attains the height of five or six feet, and afterwards ripens its seed early in the autumn.

* Mr. Burton.

COTTAGER'S GARDEN CALENDAR.

[From Wilds on 'Cottage Building.']

Catalogue of Vegetables.	January. work.	h.	February. work.	h.	March. work.	h.	April. work.	h.	May. work.	h.	June. wk.	h.	July. work.	h.	August. work.	h	Sept. wk.	h.	October. work.	h.	Nov. wk.	h.	Dec. wk	h.	Expense of seed.	Produce.
																									s. d.	
Potatoes	..	..	dig / plant	6	..	..	..	.	hoe and earth up twice	1½	rea.	..	—	..	..	..	..	..	..	..	..	..	..	..	..	0 6	4½ bush.
Radishes	..	..	sow	..	..	..	ready	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0 1	20 l. bd.
Peas and Beans	dig / sow	4½	earth up	¼	ear. up	¼	stck / ..	½ / ..	ready / do.	.. / ..	—	..	—	..	..	..	..	..	..	..	..	..	..	..	1 0 / 0 6	7 pecks / 8 pecks
Early Barnes Cabbage	..	..	earth up	¼	..	..	ready	..	——	..	—	..	..	..	sow	¼	trsp	½	man. dg. plt	3½	..	..	..	..	0 6	200 cab.
Dwarf marrow Peas	..	..	dig	1½	ear. up	½	stick	½	..	..	ready	..	—	..	..	..	..	..	..	..	..	..	..	..	1 2	8 pecks
Windsor Beans			sow		..	..	..	..	..	..	do.	..	—	..	..	..	..	..	..	..	..	..	..	..	0 8	6 pecks
Onions					sow	1	..	..	..	..	..	..	..	..	rea.	..	..	..	..	..	..	..	..	..	0 6	2 bush.
Spinage					do.	½	..	..	..	..	rea	..	..	..	..	..	..	..	..	..	..	..	..	..	0 2	
Early Turnip	..	..	digging	4	do.	¼	..	..	ready	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0 1	
Lettuce					do.	¼	..	..	..	..	rea.	..	..	..	..	..	..	..	..	..	..	..	..	..	0 2	
Scarlet Runners					...	..	..	..	sow	1	stk.	½	—	..	rea.	..	—	..	—	..	..	..	..	..	0 9	
Parsnips / Carrots	dig	10	sow / do.	1 / 2	—	..	..	..	..	..	..	..	..	..	..	..	..	..	tk. up	1	—	..	—	..	0 2	4 bush.
					..	..	..	1	..	..	..	..	—	..	..	..	—	..	do.	2	—	..	—	..	0 4	12 bush.
Barley	..	..	..	..	dg. so.	6	roll	1	roll	1	hoe	1	..	..	reap.	2	..	..	thras	5	dig	12	..	..	0 9	4 bush.
Potatoes	..	..	..	..	..	..	dg. plt.	7	hoe	2	ear.	1	earth	1	..	..	..	..	tk. up	8	..	..	dig	10	1 6	25 bush.
Sugarloaf Cabbage	..	..	..	..	dg. plt.	3	earth	¾	earth	¼	rea.	..	—	..	sow	½	..	..	trsplt.	½	..	..	dig	2	0 6	220 cab.
Savoy Cabbage	..	..	sow	¼	..	..	..	..	..	..	..	..	dg. plt.	1	..	..	..	..	..	..	..	..	rea.	..	0 3	1 0 cab.
Green curled Borecole	..	..	ready	..	sow	¼	..	..	..	..	..	..	..	..	dg. plt.	1	..	..	..	..	..	..	..	..	0 3	100
Cucumbers	..		..	..	..	..	..	..	sow	½	..	..	..	..	ready	..	—	..	..	..	..	..	..	..	0 2	90 cuc.
Leeks	..	..	..	..	sow	½	..	..	..	..	..	..	..	..	dg. plt.	1	..	..	..	..	..	..	..	..	0 2	
Potherbs,&c	dig	4	..	..	..	..	plant	3	——	..	—	..	—	..	—	..	—	..	..	..	..	..	..	..	1 0	
Mercury	..	..	..	..	—	..	—	..	——	..	—	..	..	..	..	..	plt.	1	..	..	..	..	..	..	..	
Hours mthly.		18½		15½		12½		13¾		6¼		2½		2		4½		1½		20		12		12	11 2	

It will be seen in the foregoing table, that in no one week in the year is there above 5 hours' work to be bestowed on the garden, and in some weeks not 1 hour's work; so it should all be done without ever losing one day's labour. The calculation is for rather more than a quarter of an acre.

Abbreviations.—h. hours; wk. work; ear. earth up; dg. dig; plt. plant; rea. ready; stk. stake up; trsp. transplant; man. manure; tk. take up; thras. thrash; bd. bundle; cab. cabbage; cuc. cucumbers.

MONTHLY CALENDAR.—JUNE—Sixth Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock aft. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h m.		h. m.	h. m.
1 M	153	. . .	3 50	2 30	8 5	1·2	4m 7	10a19
2 Tu	154	. . .	3 50	2 21	8 6	2·2	5 22	11 4
3 W	155	. . .	3 49	2 11	8 7	3·2	6 49	11 34
4 Th	156	Camb. East. Term div.n.	3 48	2 1	8 8	4·2	8 18	11 55
5 F	157	*King of Hanov. born* 1771	3 48	1 51	8 9	5·2	9 43	morn.
6 S	158	Oxford East. Term ends	3 47	1 40	8 10	6·2	11 5	0 10
7 *Su*	159	*Whit Sunday.*	3 47	1 29	8 11	☽	0a20	0 23
8 M	160	Whit Monday.	3 46	1 18	8 12	8·2	1 34	0 35
9 Tu	161	Whit Tuesday.	3 46	1 6	8 13	9·2	2 47	0 46
10 W	162	*Em. Week.* Oxford Trin.	3 45	0 55	8 13	10·2	4 0	0 58
11 Th	163	*St. Barnabas* [Trm. beg.	3 45	0 43	8 14	11·2	5 13	1 12
12 F	164	. . .	3 45	0 31	8 15	12·2	6 26	1 29
13 S	165	. . .	3 44	0 18	8 15	13·2	7 35	1 53
14 *Su*	166	*Trinity Sunday.*	3 44	0 6	8 16	14·2	8 36	2 25
15 M	167	. . .	3 44	bef. 7	8 16	○	9 26	3 9
16 Tu	168	Trinity Term ends.	3 44	0 19	8 17	16·2	10 3	4 6
17 W	169	. . .	3 44	0 32	8 17	17·2	10 30	5 13
18 Th	170	Corpus Christi.	3 44	0 45	8 18	18·2	10 51	6 26
19 F	171	. . .	3 44	0 58	8 18	19·2	11 6	7 42
20 S	172	*Accession of Q. Vic.* 1837	3 44	1 11	8 18	20·2	11 19	8 58
21 *Su*	173	1 S. *aft. Trin.* Longst D. / *Q. V. proc.* Sum. Quar. b.	3 44	1 24	8 18	21·2	11 31	10 15
22 M	174	. . .	3 45	1 37	8 18	☾	11 43	11 32
23 Tu	175	. . .	3 45	1 49	8 19	23·2	11 56	0a51
24 W	176	*MIDSUMMR. DAY.* / *Nat. of St John Baptist.*	3 45	2 2	8 19	24·2	morn.	2 15
25 Th	177	. . .	3 46	2 15	8 19	25·2	0 12	3 43
26 F	178	. . .	3 46	2 28	8 19	26·2	0 33	5 14
27 S	179	. . .	3 47	2 40	8 19	27·2	1 3	6 43
28 *Su*	180	2 S. *aft. Trin. Q. Vic. cr.*	3 47	2 53	8 18	28·2	1 48	7 59
29 M	181	*St. Peter.*	3 48	3 5	8 18	●	2 53	8 54
30 Tu	182	. . .	3 48	3 17	8 18	0·9	4 16	9 31

Meteorological Averages.

Barometer.	Ins.
Mean height	30·020
Highest	30·460
Lowest	29·600
Hygrometer.	°
Mean dew-point	50·7
Highest	70
Lowest	35
Mean dryness	8·0
Mean greatest do. of day	16
Greatest dryness	25
Thermometer.	
Mean temperature	58·7
Highest	90
Lowest	37
Radiation.	
Mean great. of Sun	39·9
Greatest power	65·0
Mean cold of terrest.	5·2
Greatest ditto	17·0
——	Ins.
Mean qty. of rain	1·830
Mean qty. of evap.	3·760

Table of the Winds.

	Days.	Dew-P.
N.	5	49° ·5
N.E.	6½	49 ·5
E.	2	56
S.E.	4	57
S.	1	62
S.W.	3½	56
W.	3	52
N.W.	5	50 ·5

SUNDAY LESSONS.

June MORNING.

7 Wt. S, Dt. 16 to v. 18. Ac. 10, v. 34
14 Tr. S, Gen. 1 Mt. 3
21 1 af T, Josh 10 Lk. 5
28 2 „ Judg. 4 „ 11

EVENING.

June 7 Isaiah 11.. Acts 19 to v. 21
„ 14 Gen. 18..1 John 5
„ 21 Josh. 23..Galat. 5
„ 28 Judg. 5..Ephes. 5

THE MOON'S CHANGES.

First Quart. 7th day, 1h. 17m. mn.
Full . . . 15th day, 2h. 49m. mn.
Last Quart. 22nd day, 11h. 31m aft.
New . . . 29th day, 1h. 59m. aft.

Day of Mth.	Length of Day.	Day's increase	Day break.	Twil. ends.	Sun's Semi-di.
1	h. m. 16 15	h. m. 8 30	No real Night, but constant Twilight.		15′ 47″
6	16 23	8 38			15 47
11	16 29	8 44			15 46
16	16 33	8 48			15 46
21	16 34	8 49			15 45
26	16 33	D. de.			15 45

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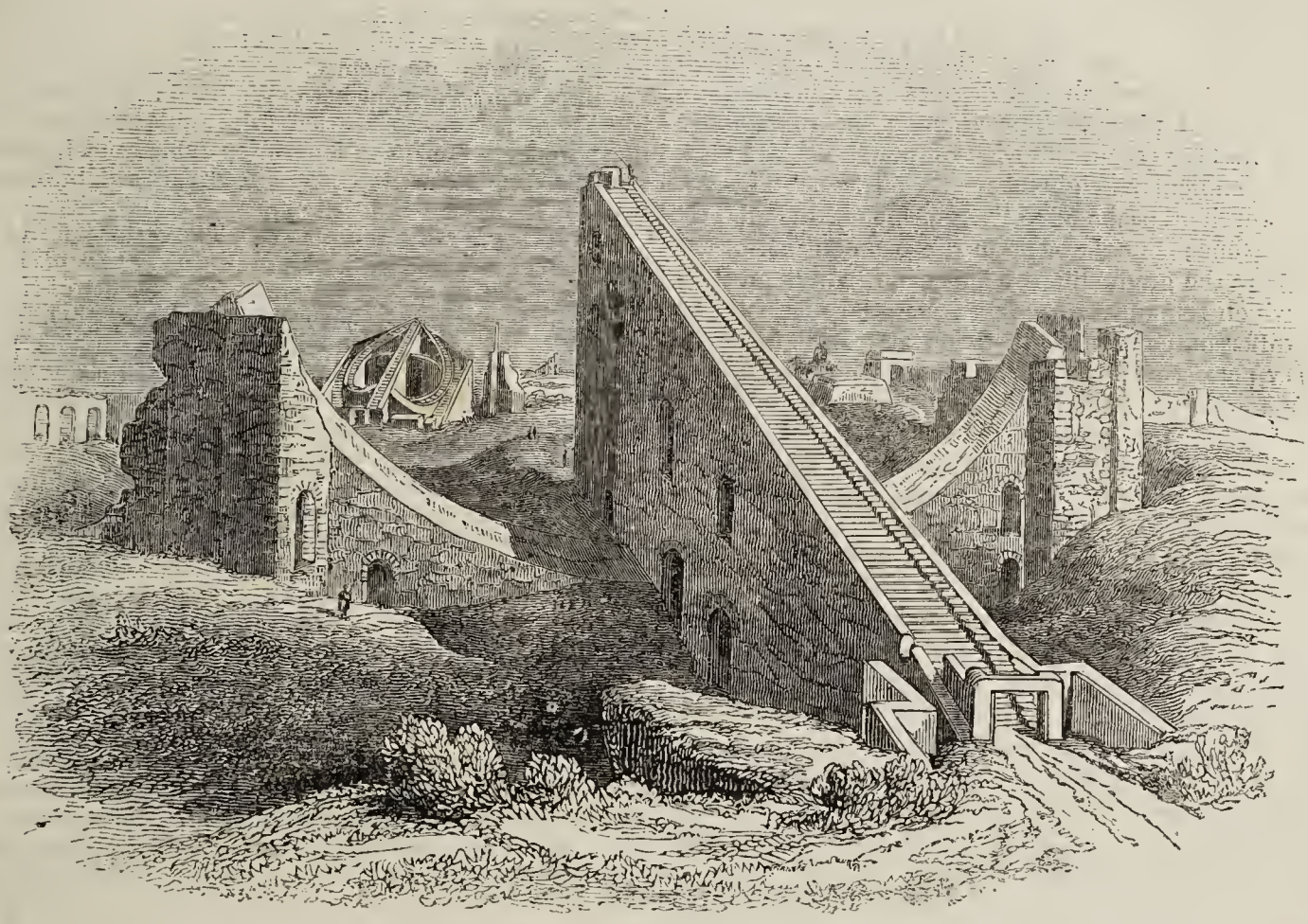
THE OBSERVATORY AT DELHI.



[The Observatory at Delhi.]

THE Gentur Muntur (or Royal Observatory) of Delhi was built by Rajah Jeysing, in the reign of Mohammed Shah, about the year 1710. The immediate objects for which it was erected may be best understood from his own published account.* "Sewai-Jeysing, from the first dawning of reason in his mind, and during its progress towards maturity, was entirely devoted to the study of mathematical science, and the bent of his mind was constantly directed to the solution of its most difficult problems; by the aid of the supreme artificer he obtained a thorough knowledge of its principles and rules. He found that the calculation of the places of the stars, as obtained from the tables in common use, gives them widely different from those determined by observation: especially the appearance of the new moons. Seeing that very important affairs both regarding religion and the administration of empire depend upon these; and that in the time of the rising and setting of the planets, and the seasons of eclipses of the sun and moon, many considerable disagreements of a similar nature were found;" he represented the matter to Mohammed Shah, whom Jeysing terms, in language that proves him as apt a courtier as he was truly a learned and able scientific man, "his majesty of dignity and power, the sun of the firmament of felicity and dominion, the splendour of the forehead of imperial magnificence, the unrivalled pearl of the sea of sovereignty, the incomparably brightest star of the heaven of empire; whose standard is the sun, whose retinue the moon; whose lance is Mars, and his pen like Mercury; with attendants like Venus; whose threshold is the sky, whose signet is Jupiter, whose sentinel Saturn; the emperor descended from a long line of kings; an Alexander in dignity; the shadow of God; the victorious king Mohammed Shah, may he ever be triumphant in battle!" A reply was given to his representation. "Since you who are learned in the mysteries of science, have a perfect knowledge of this matter, having assembled the astronomers and geometricians of the faith of Islam, and the Bramins and Pundits, and the astronomers of Europe, and having prepared all the apparatus of an observatory, do you so labour for the ascertaining of the point in question, that the disagreement between the calculated times of those phenomena and the times in which they are observed to happen may be rectified." Jeysing justly remarks that this was a "mighty task," but having "bound the girdle of resolution about the loins of his soul," he constructed several of the instruments of an observatory in brass. "But finding that brass instruments did not come up to the ideas which he had formed of accuracy, because of the smallness of the size, the want of division into minutes, the shaking and wearing of their axes, the displacement of the centre of the circles, and the shifting of the plancs of the instruments," he erected the existing great works "of stone and lime, of perfect stability, with attention to the rules of geometry, and adjustments to the meridian, and to the latitude of the

* See 'Some Account of the Astronomical Labours of Jayascinha, Rajah of Ambhere, or Jayanaga,' by W. Hunter, Esq., in 'Asiatic Researches.' To this paper we are indebted for the information contained in the following account.

place." He found the new instruments successful, but in order to confirm the accuracy of the observations made by them, he caused others of a similar kind to be constructed in Sewaï Jeypoor, Matra, Benares, and Ougein; and found his first calculations verified. Jeysing presented his new set of tables to the emperor, who stamped them with his approbation. The almanacs of Delhi and all astronomical computations are still made from these tables.

The Observatory is situated among piles of ruinous palaces, attesting most impressively the former but lost magnificence of Delhi without the gates, about a mile and a quarter distant from the city. It consists of several detached buildings. The first is a large equatorial dial, tolerably entire in its outline, but the edges of the gnomon and of the circle on which the degrees were marked are broken in several places. The gnomon measures above 118 feet; its base (each side) is computed at 104 feet, and its perpendicular height at nearly 57 feet. This instrument Jeysing speaks of as "the prince of dials." It is built of stone; but the edges of the gnomon and of the arches where the graduation was, were of white marble, little of which remains. Another equatorial dial, smaller and of different construction, stands at a little distance, in a very perfect state. The gnomon, which stands in the middle, contains a staircase leading up to its top, and on either side of the gnomon are concentric semicircles, having a certain inclination to the horizon. They represent meridians, removed by a certain angle from the meridian of the place. On each side of this part is another gnomon, of equal size to that last mentioned. The north wall of this structure connects the three gnomons at their highest end; and on this wall is described a graduated semicircle for taking the altitudes of bodies that lie due east or west from the observer. A double quadrant is described on a wall to the westward of the building. South of the great dial are two buildings, apparently exactly resembling each other, and adapted for the same purpose—the observation of the altitude and azimuth of the heavenly bodies. They are circular, with a pillar in the centre of each, rising to the top, which is open. From this pillar, at the height of about three feet, branch horizontal radii of stone to the circular wall. The radii are thirty in number; the spaces between them are equal to the radii, which increase in breadth as they recede from the pillar. In the wall, at the spaces between the radii, are recesses with holes, to enable a person to climb to the top, and containing each of them two windows. On the edges of the recesses are marked the degrees of the sun's altitude, as shown by the shadow of the pillar. The degrees are again subdivided into minutes. The spaces in the wall are divided into six equal parts or degrees, by lines drawn from the top to the bottom. By observing on which of these the shadow of the pillar falls, the sun's azimuth is determined. The altitude and azimuth of the moon and of a star may also be found by means of this erection. The dimensions of the building are thus given by Mr. Hunter: —Circumference of the building, 172 feet 6 inches; of the pillar, 17 feet; length of each of the radii, 24 feet 6 inches. The height of the building is not stated. Mr. Hunter remarks, "I do not see how observations can be made when the shadow falls on the spaces between the stone radii or sectors; and from reflecting on them, I am inclined to think that the two instruments, instead of being duplicate, may be supplementary one to the other; the sectors in one corresponding to the vacant spaces in the other, so that in one or other an observation of any body visible above the horizon might at any time be made." Between these two buildings and the great equatorial dial is an instrument, formed of mahogany, in the shape of a concave hemispherical surface, to represent the inferior hemisphere of the heavens. It is divided by six ribs of solid work and as many hollow spaces, the edges of which represent meridians, at the distance of 15 degrees from each other. The diameter of this work is 27 feet 5 inches.

LIFE IN SIBERIA.

[From the 'Survey of the North-Eastern Coast of Siberia,' by Von Wrangel, translated in the 'Foreign Quarterly Review.']

To form a just conception of life on the banks of the Kolyma, says M. von Wrangel, one must have spent some time with the inhabitants. One must have seen them in their winter dwellings and in their summer *balagans;* one must have shot down their rapid streams in the light canoe, must have climbed mountains and rocks with them, or dashed in their light dog-drawn sledges through the most piercing cold over the boundless tundra; one must in short have become one of themselves. Such was our life during the three years we spent here. We lived with them, dressed like them, fed on their dried fish, and shared with them the hardships and privations inseparable from the climate, and the frequent want even of food which it brings along with it.

Let us begin with the spring. The fishery forms their most important pursuit; indeed the very existence of the whole population depends upon it. The locality of Nishney-Kolymsk, however, is unfavourable, and the inhabitants are obliged to migrate at this season to more suitable parts of the river. As soon as the winter ceases, they accordingly abandon their dwellings in search of some convenient spot, where they forthwith construct a *balagan*, or light summer hut, and immediately commence their hostilities upon the piscatory tribe. Most of the Nishney-Kolymskites have regular country-houses of this description at the mouths of the several creeks and rivulets, which they begin to visit in April, in order to prepare for the campaign. In the middle of May, when the merchants arrive from the fair of Ostrownoye, on their return to Yakoutsk, the whole population abandons the little place, leaving the whole town to the guardianship of one Cossack sentinel, and perhaps one or two old women, whom age prevents from joining in the general pursuit.

Spring is the most trying season of the whole year. The store collected during the summer and autumn has usually been consumed for some time; the fish do not always make their appearance immediately, and the dogs, exhausted by their winter work, and yet more by the severe fast to which they have for some time been subjected, are too feeble to allow their masters to avail themselves of the *nast*,* to catch a few elks and wild reindeer. Famine then appears in its most horrible form. Crowds of Tungusians and Yukaheers come flocking into the Russian villages in search of some subsistence. Pale and ghost-like they stagger about, and greedily devour every species of garbage that falls in their way. Bones, skins, thongs of leather, everything in short that the stomach will receive, is eagerly converted into food. But small is the relief they find; for the unthrifty townspeople are by this time almost as ill off themselves, and living upon the scanty remnant of fodder stored up for the use of the dogs, so that many of these faithful and valuable animals perish nearly every year of hunger. There is a storehouse established by the government, where rye-flour is sold to every comer; but the expense of conveying it from so enormous a distance enhances the price to such a degree that few are able to avail themselves of the facility thus afforded them. Although the additional accommodation is granted them of not paying before autumn, still there are not many who can afford to give twenty rubles for a pood of flour, which moreover has often been damaged during the protracted journey it has had to perform. Three of these periods of horror did I witness, during three succeeding springs, and even now I shudder when I reflect on the scenes of suffering which I beheld, and of which it would be utterly impossible for me to attempt a description.

It is just when famine is at its worst that relief arrives. Suddenly countless swarms of birds make their appearance. Swans, geese, ducks, and several descriptions of snipes.

* When the warmth of the spring sun thaws the surface of the snow, it freezes again during the night, whereby a thin crust of ice is formed, strong enough to bear a sledge with its team of dogs. In this condition the snow is called *nast*, over which the elks and reindeer are pursued during the night; and as, owing to their greater weight, they are constantly breaking through the ice, they are caught by the hunters with little trouble.

These are the first heralds of spring, and at their coming hunger and want are at an end. Old and young, men and women, all that can walk or run, now rush out with guns, bows, and sticks, to kill as many as they may. In June the ice breaks up, a profusion of fish comes crowding into the river, and all hands are in movement to avail themselves of the short season of grace to provide a store for the coming year. But here a new misfortune often assails them. The stream is not strong enough to float away with sufficient rapidity the mighty masses of ice. These accumulate in the narrows and shoals, and the water, arrested in its course, quickly overflows the whole of the low country, and, if the inhabitants are not quick enough in driving their horses to the hills, the poor animals are infallibly lost. In the summer of 1822 we had such an inundation at Nishney-Kolymsk, which came upon us so suddenly that we had only just time to take refuge with a few of our most indispensable articles upon the flat roofs of our huts, where we were forced to remain for upwards of a week. The water rushed with fearful rapidity between the houses, and the whole place looked like a little archipelago of house-tops, among which the inhabitants were merrily rowing about in their canoes, paying one another friendly visits and catching fish.

More or less these inundations occur every year, and when the waters subside the main fishery with nets begins. Fish form the chief food of man and dog, and for the yearly consumption of the hundred families that compose the little community of Nishney-Kolymsk, at least three millions of herrings are required. Many other kinds of fish are caught at this time, among which is the *Nelma*, a large description of salmon-trout, but the first fish are generally thin, and are mostly converted into *yukhala* for the dogs; that is to say, cut open, cleaned, and dried in the air. From the entrails an abundance of train-oil is obtained, which is used for food as well as for fuel. The *yukola* is distinguished from the *yukhala* merely by the selection of a better kind of fish, and by greater care in the preparation.

The proper season for bird-hunting is when the animals are moulting, when, having lost their feathers, they are unable to fly. Large detachments are then sent off from the fishing-stations, and numbers of swans and geese are killed with guns, bows, and sticks. The produce of this chase is said to have diminished greatly of late years. Formerly it was no unusual thing for the hunters to bring home several thousands of geese in one day, whereas now they are content if they can catch as many during the whole season.

While the men are fishing and hunting, the women make the best use of the interval of fine weather, to collect the scanty harvest which the vegetable kingdom yields them, in the shape of a few berries and aromatic herbs. The gathering in of the berries is a season of gaiety, like the vintage in southern climes. The young women wander about in large parties, spending the nights in the open air, and amusing themselves with song and dance, and other innocent diversions. The berries themselves are preserved by pouring cold water over them, and freezing them, in which condition they form one of the favourite dainties during the winter. Besides the berries, they collect at this time the *makarsha*, a mealy root found in large quantities in the subterranean storehouses of the field-mice. The young girls appear to have a peculiar tact in discovering the magazines of these little notable animals, whom, without the least remorse, they plunder of the fruits of their provident industry.

Patriarchal Customs.—There is a distinct race of people in the mountains of Austrian Galicia, whose habits are singularly patriarchal. Whole families, with their entire offspring, sons, daughters, cousins, and grandchildren, continue to abide under one and the same roof so long as it can be made to contain them, obeying the behests of the elder father as their lord paramount. The same vestige of ancient times prevails among the Rusnacks (originally Sclavonic-Russians) of the Galician plains. The father is lord and master over the family; every arrangement, even to the very employments of the female sex, depends upon his sovereign will. He appoints the work to be done by his sons and his daughters-in-law, according to their respective qualifications. His will is implicitly obeyed by all around him, and his interference sets every domestic variance at rest. To one son he gives charge of the cattle; another he sends abroad with his waggon and horses; and however great the number of males under his roof, for each he finds some distinct occupation. One of his daughters is commissioned to assist her mother in household concerns, another has the spindle assigned to her, a third the loom, and a fourth is sent out to sell the linen made in the family. These homesteads contain within themselves their own builder, wheelwright, carpenter, joiner, tailor, and shoemaker; and their kitchens are better ordered and their tables more substantially garnished than those of any of their neighbours. In every dwelling there is a small chamber, to which the elder of the family alone has the key, where he deposits his savings, all in gold or silver, and sometimes of no trivial amount: neither wife nor children ever venture to inquire into its extent. When their waggons go upon long journeys, a white horse is always one of the team; the reason they give for this custom is, that, as they turn them loose at night to graze, the white horse enables them readily to track them if they stray afar; and he is also a rallying point for his comrades. Robbery and murder, if not unknown among them, are at least of exceedingly rare occurrence; a circumstance which is fully borne out by the reports of the criminal courts.—*J. G. Kohl.*

Factory Baths.—In the autumn of last year I established some warm baths, which have been brought into very general use, and have contributed materially to the health, comfort, and cleanliness of the people. The bathing-room is a small building close behind the mill, about twenty-five feet by fifteen. The baths, to the number of seven, are ranged along the walls, and a screen about six feet high, with benches on each side of it, is fixed down the middle of the room. The cold water is supplied from a cistern above the engine-house, and the hot water from a large tub, which receives the waste steam from the dressing-room, and is kept constantly almost at boiling temperature. A pipe from each of these cisterns opens into every bath; so that they are ready for instant use. The men and women bathe on alternate days, and a bath-keeper for each attends for an hour and a half in the evening. This person has the entire care of the room, and is answerable for everything that goes on in it. When any one wishes to bathe, he comes to the counting-house for a ticket, for which he pays a penny, and without which he cannot be admitted to the bathing-room. Some families, however, subscribe a shilling a month, which entitles them to five baths weekly; and others hold a *general* subscriber's ticket, which always gives them admittance to the room. I think the number of baths taken weekly varies from about twenty-five to seventy or eighty. During the first four months (from November to February inclusive) the average was about seventy-five weekly. I pay the bath-keepers two shillings and sixpence and two shillings a-week; and I believe this amount has been more than covered by the receipts. The first cost of erecting the baths was about eighty pounds.—*Letter to Mr. Leonard Horner.*

Dilemmas.—One of the most celebrated dilemmas is one of the most ancient. A rhetorician had instructed a youth in the art of pleading, on condition that he was to be remunerated only in case his pupil should gain the first cause in which he was engaged. The youth immediately brought an action against his teacher, of which the object was, to be freed from the obligation which he had contracted, and then endeavoured to perplex his instructor with this dilemma: "If I gain my suit," said he, "the authority of the court will absolve me from paying you; If I lose, I am exonerated by our contract." The rhetorician answered by a similar dilemma: "If you gain your suit, you must pay me according to our contract; if you lose the suit, you must pay in compliance with the decision of the court." A just but severe man built a gallows on a bridge, and asked every passenger whither he was going; if he answered truly, he passed unharmed; if falsely, he was hanged on the gallows. One day a passenger, being asked the usual question, answered, "I am going to be hanged on the gallows." "Now," said the gallows-builder, "If I hang this man, he will have answered this truly, and ought not to have been hanged; if I do not hang him, he will have answered falsely, and ought to have been hanged." It is not recorded what decision he came to.—*Book of Table-Talk.*

THE HERONRY.

[From a Correspondent.]

[The Heronry on the River Findhorn, Morayshire.]

There are few, if indeed any objects which tend so much to diversify and adorn the countries in which they are placed, and through which they wander, as rivers. While the mountains remain immoveable in their grandeur, and the forests occupy the same station from their youth till their decay, there is an ever-changing diversity of beauty in the waters, which captivates and delights the eye. We trace them from their source, follow them in their windings, behold them expand as they lengthen in their race, —receiving the accumulating tribute of a hundred streams,—and at last view them calmly gliding to the rest which awaits them in the bosom of the mighty ocean.

If Scotland cannot boast of the magnitude of her rivers, she can at least say much of their multiplicity. The Clyde, the Tweed, the Tay, the Forth, the Spey, Don, Dee, and Findhorn are all names of note. Each has a character of its own, which, of course, it receives from the district through which it flows. Some all grace and beauty, others rough and rugged as the rocks over which they rush and roar in their career. To the latter class, for a considerable part of its way, belongs the Findhorn. It takes its rise among the hills of Badenoch, in the shire of Inverness, and flows north-east through part of that shire, as also those of Nairn and Moray, till at length, about fifty miles from its source, it empties itself into the Moray Frith, at the little port which bears its name.

The scene which we have selected for illustration is one which has long been celebrated in its neighbourhood, and few are the travellers who journey in its vicinity without paying it a visit. As it is little more than four miles south-west from the town of Forres, we shall suppose the stranger starts from thence, and accompany him. There are two methods of proceeding, either by walking along the side of the river, or taking the Highland road to the point from whence we strike off. The former is certainly the more pleasing of the two, but liable to an objection, inasmuch as the eye gets accustomed to the beauty of the scenery, and the impression of novelty wears off ere the principal spot be attained. We therefore prefer the latter, and a duller, or one more calculated to sober down the imagination, need not be desired. However, we have arrived at a bye-path, leading through a forest of firs, with the monotony of whose appearance our eyes have for the last half-hour been overfamiliar, and a few minutes' walk brings us to a halt on an eminence. We are at the Heronry.

What a delicious panoramic view is now spread before us! The river, for the last three miles of its course, has been confined within narrow limits by the approaching rocks between which it flows. It here widens, and flows in a gentler motion, unimpeded by opposing obstacles. On the right there rise rocks of a reddish freestone, over which the birch and the ash droop their graceful branches. On the left, some hundreds of feet beneath the spectator, and on the opposite side, a colony of herons have established their abode. From this circumstance the spot derives its name. The trees, on which the majority of their nests are built, are venerable from their age, and have, in all probability, supported these 'procreant cradles' for many generations. Meadows of luxuriant verdure next meet the eye, where, if tradition can be trusted, gallant knights once assembled to exhibit their feats in tilt and tourney, while gay ladies displayed their charms and cheered them with their smiles. In our quieter times, the browsing cattle give an air of pastoral beauty and repose, which is more in accordance with the scene than the din of arms or the pomp of chivalry. Rising from the margin of these, we behold the outskirts of the far-spreading forests of Darnoway, embosomed in which is the castellated mansion of the noble proprietor, the Earl of Moray, containing the famous hall of Randolph, with its carved oak ceiling,—one of the finest specimens of that work in the kingdom. From the point where we lose sight of the river, the whole country seems wooded even to the Frith; this, however, is a visual illusion, there being

some miles of well cultivated land between, but lying too low for the range of the eye. The line of white hills which appear to the right, in the distance, are certain elevations of sand, which are supposed to have arisen from some convulsive irruption of the German Ocean, and buried beneath them one of the most fertile portions of the province—the estate of Culbin—somewhere about the beginning of the eighteenth century. They are now called the sand-hills of Culbin. The Moray Frith, spotted with the white sails of passing vessels, and the shores of Ross, Caithness, and Sutherland, bound the prospect.

Such is a limited enumeration of the more prominent objects in this interesting and diversified landscape. But words cannot always do justice to the full loveliness of nature. We can easily describe the appearances of things; but to experience the countless feelings which these engender, actual contemplation is necessary. In some respects, a beautiful country is at all times beautiful; but there are seasons when that beauty is heightened. In the noontide of a midsummer day, the Heronry will not appear so striking, from the uniformity of tone which pervades it; but at the sunset of an autumnal afternoon, when the western heaven is a-flame with the brightness of the sinking luminary, and every tree mantled with golden foliage, the murmuring of the river—darkened by the shadows of innumerable branches—blending sweetly, and not without a "something of sadness," with the cry of the heron as he sails in many a proud sweep over his home—then is the true hour for gazing on the view, and cold would be the heart of the spectator who would not sigh, as he turned with regretful step, at leaving such an enchanting scene to the evening cloudiness which would so soon overshade it.

The long-necked heron is a very elegant bird, and in flying its motions are extremely graceful. Its food consists of the smaller sorts of fish, worms, frogs, &c. At a period not very remote from our own, they afforded sport to the magnates of the land, in the royal and noble exercise of hawking. The rocks of the Findhorn were long celebrated for the excellence of the hawks which established themselves in their crevices. They were called Darnoway hawks, and are eulogised in the 'Abbot,' in the dialogue between Michael Wing-the-Wind and Adam Woodcock, in the 'Hostelry of Holyrood.' But times are changed, and instead of the fair lady with the falcon on her wrist, the heron has now only to dread for an enemy the truant schoolboy, who, at the risk of his life, despoils it of its eggs.

ON MEASURES OF LENGTH AND CAPACITY.

We lately presented a brief sketch of the principal changes which have from time to time been made in the measures of *weight* in this country, and on the principle by which weight is determined through the means of a pair of scales, a steelyard, &c. These details may consistently be followed by a notice of the measures of *length* and of *capacity* used in England and in France.

We had occasion, in the papers just alluded to, to state that the first rough attempt to obtain a standard of length in this country was by taking the length of the arm of one of our early kings, and calling that length a *yard*. It is probable that a metallic bar was made of that exact length, to serve as a standard from whence commercial yard-measures might be made. In some of our old arithmetical tables, we are instructed that "Three barley-corns make one inch; twelve inches, one foot; three feet, one yard." It is not now possible to say when this unit of measure sprang up; but it is evident, from its rudeness and inaccuracy, that its origin must be dated from a very early period; and we may reasonably doubt whether the "yard" derived from the length of a king's arm precisely equalled that derived from the length of 108 barley-corns. There appears to have been a tendency in many countries to make the human body in various ways a standard of length; and many terms more or less in use at present in England point to the existence of this custom;—thus, the *fathom* was the utmost extent which a man could fathom or reach when the arms were stretched out to the full extent, measuring from the finger-end of one hand to that of the other; and this was farther deemed to be equal to the height of the same individual:—the length of the *pace* was taken at one half of the stature; of the *foot*, one-sixth; and the *span* (the distance from the thumb to the little finger of an expanded hand), equal to one-eighth;—the *hand-breadth*, the *thumb-breadth*, and the *finger-breadth* equal respectively to one-third, one-twelfth, and one-eighteenth of the length of the foot. These measures of course vary in different individuals, whether symmetrically formed or not, and in course of time the *fathom* became deemed equivalent to two yards, although that is certainly beyond the stretch of the arms of the majority of men. By fixing the value of the fathom at two yards, we find that the *pace* is one yard, the *foot* a third of a yard, the *span* nine inches, the *hand-breadth* four inches, the *thumb-breadth* an inch, and the *finger-breadth* two-thirds of an inch. That something equivalent to this prevailed in France is shown by the circumstance, that the French word *pouce* means both thumb and inch; and in Germany the same rule used to be followed: the German for inch is *zoll*, and under the word zoll, in an old German dictionary, we find, "zoll, ein daum-breit," a thumb-breadth, the twelfth part of a foot.

But throughout this arrangement we see that we do nothing towards obtaining a real standard of length, for thumb-breadths and foot-lengths vary as much as the stature of men: it is well enough to say that a fathom shall equal two yards, but then we must know precisely what a yard means. Hence we see the necessity of having a measure of length, formed of metal or some other durable material, which shall serve as a standard from one age to another; and there appears to have been a standard of this kind kept for some centuries in England; but the first attempt at making a scientific examination of this standard was in the last century.

It is stated in the 'Philosophical Transactions,' that in 1742, "some curious gentlemen, both of the Royal Society of London and of the Royal Academy of Sciences at Paris (thinking it might be of good use for the better comparing together the success of experiments made in England and in France), proposed that accurate standards of the measures and weights of both nations, carefully examined and made to agree with each other, might be laid up and preserved in the archives both of the Royal Society and of the Royal Academy of Sciences at Paris; which proposal having been received with the general approbation of both those bodies, they were pleased to give the necessary directions for carrying the same into effect." Two well-squared brass rods, about three feet and a half long each, were carefully graduated by Graham from the standard yard kept at the Tower: they were then sent to France, and graduated from the Paris half-toise (the toise, = 6·395 English feet, being the standard of length in France at that time). One of the doubly-graduated rods was then kept at Paris, and the other returned back to London: the latter subsequently had the yard and the half-toise each divided into three equal parts, forming respectively English feet and French feet. The rods were then laid up in the archives of the two Societies, where we believe they still remain.

Shortly afterwards, the Royal Society's standard was compared with those kept at the Exchequer: these were, a standard yard made in the time of Henry VIII., and long disused,—a yard, and an ell, each made of brass rods of the breadth and thickness of half an inch, the ell being equal to one yard and a quarter, and both hav-

ing been in use since the time of Queen Elizabeth. Guildhall contained two standard measures of length at the same time, one of a yard and the other of an ell. The Clock-Makers' Company also possessed a brass standard yard, presented to them from the Exchequer in 1671. In some of these cases, the standard consisted of a rod exactly an ell or a yard in length; in others, of a longer rod with a portion of its length graduated; and in others, of a matrix or bed with two pins inserted at the prescribed distances. All these standards were carefully compared by Graham; and, taking the Exchequer yard as the true one, the others were found to vary from about one-twentieth of an inch plus to one-fifteenth of an inch minus that length. For common purposes this may seem a difference of no great importance; but in a scientific point of view it is very considerable. Graham made an additional graduation on the Royal Society's standard, equal to the Exchequer yard.

In 1758 the legislature turned attention to this subject; and after some investigations on the comparative lengths of the various standards, ordered a rod to be made of brass, about 38 or 39 inches long, and graduated from the Royal Society's yard: this was marked "Standard Yard, 1758," and was laid by in the care of the clerk of the House of Commons. For commercial purposes another bar was made, with the yard marked off from the same standard; but it had two upright fixed cheeks, placed exactly a yard asunder, between which any commercial yard measures might be placed, in order to have their accuracy tested: it was graduated into feet, one of the feet into inches, and one of the inches into ten parts. This standard was to be kept at the Exchequer. In 1760, a copy of Bird's standard, made two years before, was constructed.

Some years after this, Mr. Troughton, the eminent mathematical instrument maker, constructed a very accurate scale for his own use as a mechanician, and afterwards made a copy of it for Sir George Shuckburgh: in these scales, dots were placed at distances of one-tenth of an inch asunder along the whole scale; they were therefore not so much yard measures as measures of tenths of an inch: 360 of these divisions of course made a yard, and Mr. Troughton took as a standard a yard measure made by Bird, for Harris, assay master at the mint. These measures were for purely scientific purposes; and it was not till 1814 that parliament again interfered in the matter: the result of this interference was, that Bird's standard of 1758 was still to be deemed the English standard, and that the length of a pendulum vibrating seconds in the latitude of London was 39·13047 of those inches of which the standard yard contained 36. From 1818 to 1831, other investigations were entered into, but they ended, as before, in confirming Bird's scale of 1758, or rather the copy of it made in 1760, as the English standard; and as subsequent experiments had shown the length of the seconds pendulum to be not exactly what the former committee had determined it, it was further stated that the seconds pendulum equals 39·13929 inches of Bird's scale, and the French mètre equals 39·37079 inches, the English standard being at a temperature of 62° Fahr. These regulations were confirmed by an act of parliament made in 1824, the parliamentary standard of 1760 being called the imperial standard yard; and Mr. Baily has shown that on account of the confusion amongst the several standards, the standard yard became permanently 1-140th of a inch longer than the ancient yard of the kingdom, although such a deviation does not appear to have been contemplated. Bird's two scales, of 1758 and 1760, were destroyed in the fire which consumed the houses of parliament in 1834; so that there is at present no standard, strictly speaking, in England, for the act of 1824 declared Bird's scale of 1760 the only legal standard, and there is no exact copy of it existing, as the Exchequer standards do not precisely agree with it. Within a few years a very delicate standard has been made for the Astronomical Society, concerning which, and a comparison between its graduation and those of most of the other scales of which we have been speaking, an elaborate Report has been given by Mr. Baily, in the 9th volume of the 'Memoirs' of that Society.

It would be impossible to trace the changes that have occurred in the measures of capacity; those relating to length have been sufficiently complicated, but those of capacity have been much more so. The terms sack, bushel, gallon, have all had different significations in different parts of the country. A wine gallon contained 231 cubic inches, but a beer gallon 282 inches; and as the gallon was the unit of liquid measure, all other denominations varied in the same proportion. Again, the Winchester bushel contained 2150·42 cubic inches, whereas the coal bushel contained 2217·6 inches: there was also the very absurd custom of heaped measure for some goods, and strike measure for others. Instead of attempting to discover the sources of these discrepancies, we will show how they were dealt with by the act of 1824. Heaped measure was still continued for certain goods; but for liquids the unit of measure was declared to be the imperial gallon, everywhere equal: this gallon measure is such as to contain 10 pounds avoirdupois weight of distilled water, weighed in air of which the temperature is 62° Fahr., and barom. 30°; that this gallon should be subdivided into quarts and pints; and that multiples of it should form the peck, the bushel, and the quarter. It is found that 10 lbs. of water, under the circumstances above mentioned, measure 277·274 cubic inches, which are therefore the cubic contents of an imperial gallon. For the measurement of those substances sold by heaped measure, there were certain regulations as to what proportion the heaping shall bear to the diameter of the bushel or peck measure; but these we may pass over, for by an act which came into operation January 1, 1835, all heaped measures are abolished. Coals are now sold by weight instead of by measure; and of those commodities which are still sold by measure, the imperial gallon of 277·274 cubic inches is used, without heaping. The imperial gallon is less than the old ale gallon, but greater than the old wine gallon. Of the chaldron, the hogshead, the tun, &c. we need not here speak, for they are all derived from the gallon, and their amount may be seen in any table of weights and measures.

We must now briefly speak of the measures of length and capacity used in France. Before the introduction of the metrical system at the end of the last century, the principal measures of length were the toise, the foot, the inch, and the line; the toise being equal to six feet, and the French foot being to the English in the ratio of about 16 to 15. The measure of capacity was the boisseau (bushel), of a capacity of 656 cubic inches; and various multiples and aliquot parts were used for larger and smaller quantities of corn and other dry goods, with the names of *muid*, *septier*, *mine*, *minot*, and *litron*. For liquids there were the *pinte*, *velte*, *muid*, *feuillette*, *quartants*, and *tonneau*. All these measures, as well as the measures of land, were exceedingly variable in different parts of France; and it was one of the objects of the metrical system to introduce order into this chaos of customs. We explained, in the article on Weights, the nature of the *mètre*, viz., that it equals the ten-millionth part of the quadrant of the earth's circumference. How other measures were produced from the *mètre*, we will here explain.

The mètre is the unit of length, and other measures equal to 10, 100, &c., 1-10th, 1-100th, &c., *mètres*, have received appropriate names which instantly show their respective values. A square, the side of which equals 10 mètres, is made the unit of surface, for land measure, &c., under the name of *Are;* and this has certain multiples and aliquot parts, such as the *hectare*, *decare*,

deciare, *centiare*, &e. For measures of eapacity, for liquids, &c., the unit is the *litre*, being a eube, the side of which is the tenth part of the mètre; and for coarse solid substances, sueh as fire-wood, the unit is the *stere*, or mètre cube, both of whieh are susceptible of the same modes of eombiuation and of subdivision as we have before alluded to. All these measures, and the varieties of each, may be redueed to English terms by remembering that they are all derived from the *mètre*,—that the mètre cquals about 39½ English inehes,—that the Greek prefixes *deca*, *hecato*, *kyro*, and *myrio* imply 10, 100, 1000, and 10,000,—and that the Latin prefixes *deci*, *centi*, *milli* imply 1-10th, 1-100th, 1-1000th.

It was stated in our former paper that the French government were eompelled to yield to the prejudiees of the people, by so arranging the new system as to permit of the use of the old and aeeustomed names of measures of weight. The same has oecurred in other respeets, and many of the measures of length and of eapaeity are now a sort of jumbling eompound between the old system and the new. Although men of science almost universally approve of the metrical system, it does not appear to be mueh more in favour now than it was forty years ago among the large mass of shopkeepers and retail details. It was the difficulty thus opposed to the ehanging of old habits and eustoms that induced the English legislature, in 1824, to adhere to the old measure of length, notwithstanding its unseientific eharaeter.

EPSOM SALTS.

It frequently happens that many of the ordinary terms of soeial life, when adopted into the language of scienee, reeeive a very extended or a very restrieted meaning, and not unfrequently a meaning entirely opposite to that eonveyed by their popular use. Thus the word *salt*, in every-day language, is confined to that valuable seasoner and preserver of our food whieh is almost as necessary to health as bread or water is, and whieh has been known and in constant use from the remotest times; whereas in ehemistry, the term *salt* has a very wide and eomprehensive meaning, and is the generie term applied to those eompound bodies formed by the eombination of aeids, with either alkalies, earths, or metallie oxides. There are upwards of two thousand of sueh eompounds or salts, the properties of which are very various: some salts are sour, others bitter, others sweet, others without any taste at all; some are very pungent to the smell, and others are wholly inodorous.

Again, in popular language, the term *salts* is eonfined to a laxative medicine in very eommon use; whereas it forms only a solitary example out of the large number of salts that we have just stated. The term a "dose of salts" is by eommon eonsent applied to a union of sulphurie acid and magnesia, ealled sulphate of magnesia, or Epsom salts.

About the year 1695 a mineral spring at Epsom, in Surrey, was in high repute; and in order to extend the benefits of this spring, an attempt was made to extraet its saline matters by evaporating the water: the attempt suceeeded, and a salt was proeured, whieh, from the plaee of its origin, obtained the name of Epsom salts. As ehemieal seienee improved, eheaper and more abundant sourees of the salt were diseovered. It was not only traeed in the water of Sedlitz and other springs, but also in union with lime, in a class of rocks called magnesian limestone. It has also been diseovered in sea-water.

There are several modes of obtaining Epsom salts on a large seale, some of which we will briefly describe.

When the souree is magnesian limestone, the stone is first broken up into small pieces, and a quantity of sulphurie acid, diluted with water, is added. By the aetion of the acid, two eompounds are formed, viz. 1st, *sulphate of lime*, which is a hard, solid, white, insoluble substanee, eommonly known by the name of plaster of Paris; and 2nd, *sulphate of magnesia*, which is soluble. Now the peculiar value of this process is, that of the two eompounds which are formed by the addition of sulphurie aeid to the magnesian limestone, one is insoluble, and remains at the bottom of the vessel in a solid state, and the other, which is soluble, remains in solution among the liquid contents of the vessel. In this proeess, advantage is taken of a beautiful law of eombination, which is of very extensive operation: this law is ealled the law of definite proportions, whereby substanees unite in eertain fixed and well-known proportions, and refuse to unite in any other: thus, in sulphate of lime, 40 parts of sulphuric acid unite with 28 part of lime (by weight); and in sulphate of magnesia, 40 parts of acid unite with 20 of magnesia. These proportions being always and everywhere the same, it follows that the manufacturer of Epsom salts ean easily ealculate beforehand the quantity of sulphurie acid neeessary to be added to any given quantity of magnesian limestone.

The solution of sulphate of magnesia obtained in the above process is drawn off, filtered (that is, strained, in order to free it from solid impurities), and then set aside to crystallize.

As an example of the formation of Epsom salts, the following little experiment, which is by no means difficult to perform, may be interesting:—Take a wine-glass about two-thirds full of water, and add to it about 20 or 30 drops of sulphurie aeid. Then take a little common magnesia, and add it to the dilute aeid: keep adding so long as there is an effervesceenee. When this ceases, and the solution is quite clear and limpid, all the aeid is neutralised, and a solution of sulphate of magnesia is formed. Pour this solution into a saucer, and set it by in a warm place, sueh as on the chimney-piece; and in a few days erystals of Epsom salts will begin to appear: in a few days more, all the liquid will dry up, and nothing but solid salt will remain. This simple experiment will show the reader one method by which chemical compounds are formed. Sulphurie acid is an intensely sour, eorrosive, and poisonous substanee; magnesia is mild and tasteless, and insoluble in water: whereas the union of these two bodies produees a substance whose properties are altogether different from those of its component parts. Sulphate of magnesia is intensely hitter,* very soluble in water, and is not in any degree poisonous.

The proeess for obtaining Epsom salts from magnesian limestone is sometimes varied by digesting (*i.e.* steeping) the stone in as much muriatie acid as will dissolve the lime only; and after washing the resulting eompound with water, adding an equivalent quantity of sulphurie acid. "This," says Dr. Ure, "is certainly the simplest and most profitable proeess for manufacturing this salt upon the great seale."

Sulphate of magnesia is obtained in Italy from schistose minerals, which contain sulphur and magnesia. These minerals are roasted, and then moistened and exposed to the air for a few months, during which time the salt forms on their surfaee. By solution in water, with the addition of a small quantity of lime to throw down any metallie substance in solution, and by repeated erystallizations, the salt is obtained pure.

This salt also occurs abundantly in alum-works; but its separation and purifieation are too expensive to make this a source from whenee eommeree may be supplied with this useful artiele.

We have stated that Epsom salts oecur in sea-water. In the process of obtaining culinary salt from sea-water, a liquor drains off from the sea-salt after it has been removed from the boiling-pans. This liquor contains Epsom salts, and is ealled bittern, or bittern water. As the operations for obtaining salt from sea-water are carried

* Hence the salt is called *Sel amer* by the French, and Bittersalz by the Germans.

on in summer, all the bittern obtained in the process is collected in pits lined with clay and reserved for the winter, when the manufacture of Epsom salts takes place. This bittern is pumped up into the salt-pans, and boiled for several hours, in proportion to its strength. The scum which rises is carefully removed; and when a thin pellicle of salt forms on the surface, the proper degree of concentration is attained. The fires are then put out, and the liquor left till the following day; it is then drawn off, and left to crystallize. This process depends greatly on the state of the atmosphere: on a fine clear frosty night, a crop (as it is called) of crystals is often obtained, which, in less favourable weather, would require a whole week to produce. When the liquor yields no more crystals, it is allowed to run off into the pit. In this way, successive portions of bittern are treated, until the quantity of salt produced is insufficient to pay for fuel and wages: the bittern is then said to be dead, the pits are opened, and the liquor is allowed to flow into the sea. Epsom salts thus procured have been found to retain a little sea-salt, which makes them liable to become moist by exposure to the air. The late Dr. Henry, however, obtained a patent for a process whereby this defect was entirely obviated.

Epsom salts are sometimes found native. They are found in the quicksilver-mines in Spain, mixed with the soil. They are also found occasionally as a fine incrustation on damp walls of cellars and new buildings. There is also a cave a mile and a quarter long near Jeffersonville in the United States, called the Epsom-Salt Cave, whence immense quantities of that substance are procured.

Sulphate of magnesia is colourless when pure; but it often contains a minute quantity of iron, which on exposure to the air gives it a reddish tint. Epsom salts dissolve in their own weight of water at 60°, and in somewhat less than three-fourths of their weight of boiling water.

Oxalic acid has frequently been mistaken for Epsom salts, and fatal consequences have attended the mistake. The reader will find a few precautions on this subject in a paper on Oxalic Acid, in the 'Penny Magazine,' No. 430.

THE HARVEST MOUSE.

White, of Selborne, who suggests the name of *Mus minimus*, appears to be the first who drew the attention of naturalists to this the smallest of British quadrupeds. He wrote an account of it to Pennant, who called it the *Less long-tailed Field Mouse* and the *Harvest Mouse*. White thus introduces his discovery to Pennant: "I have procured some of the mice mentioned in my former letter, a young one and a female with young, both of which I have preserved in brandy. From the colour, size, shape, and manner of nesting, I make no doubt but that the species is nondescript. They are much smaller and more slender than the *Mus domesticus medius* of Ray, and have more of the squirrel or dormouse colour; their belly is white; a straight line along their sides divides the shades of their back and belly. They never enter into houses; are carried into ricks and barns with the sheaves; abound in harvest; and build their nests amidst the straws of the corn above the ground, and sometimes in thistles. They breed as many as eight at a litter, in a little round nest composed of the blades of grass or wheat. One of these I procured this autumn, most artificially platted, and composed of the blades of wheat, perfectly round, and about the size of a cricket-ball, with the aperture so ingeniously closed, that there was no discovering to what part it belonged. It was so compact and well fitted, that it would roll across the table without being decomposed, though it contained eight little mice that were naked and blind. As this nest was perfectly full, how could the dam come at her litter respectively so as to administer a teat to each? Perhaps she opens different places for that purpose, adjusting them again when the business is over; but she could not possibly be contained herself in the ball with her young, which moreover would be daily increasing in bulk. This wonderful procreant cradle, an elegant instance of the efforts of instinct, was found in a wheat-field, suspended in the head of a thistle." And again "As to the small mice, I have further to remark, that though they hang their nests for breeding up amidst the straws of the standing corn above the ground, yet I find that, in the winter, they burrow deep in the earth, and make warm beds of grass; but their grand rendezvous seems to be in corn-ricks, into which they are carried at harvest. A neighbour housed an oat-rick lately, under the thatch of which were assembled near an hundred, most of which were taken, and some I saw. I measured them, and found that from nose to tail they were just two inches and a quarter, and their tails just two inches long. Two of them, in a scale, weighed down just one copper half-penny, which is about the third of an ounce avoirdupois; so that I suppose they are the smallest quadrupeds in this island. A full-grown *Mus medius domesticus* weighs, I find, one ounce lumping weight, which is more than six times as much as the mouse above; and measures from nose to rump four inches and a quarter, and the same in its tail. . . . As my neighbour was housing a rick, he observed that his dogs devoured all the little red mice they could catch, but rejected the common mice; and that his cats ate the common mice, refusing the red." Thus far White. Dr. Gloger describes one of these nests as beautifully constructed of the panicles and leaves of three stems of the common reed interwoven together, and forming a roundish ball, suspended on the living plants about five inches from the ground. On the side opposite the stems, rather below the middle, was a small aperture, which appeared to be closed during the absence of the parent, and was scarcely observable even after one of the young had made its escape through it. The inside, when examined with the little finger, was found to be soft and warm, smooth, and neatly rounded, but very confined; it contained only five young; but another, less elaborately formed, sheltered no less than nine. The panicles and leaves were slit into minute strips or strings by the teeth of the animal, in order to assist the neatness of its weaving. Mr. Macgillivray found one of these nests in Fifeshire composed of dry blades of coarse grass, arranged in a globular form, and placed in the midst of a tuft of *Aira cæspitosa*, nine inches from the ground: it contained six or seven young, naked and blind. The food of this little mouse consists of corn and grass-seeds, insects, and earth-worms: one to which a bit of the tail of a dead blind-worm, *anguis fragilis*, was presented, devoured it greedily. Of insects it is very fond. Mr. Bingley says, "One evening, as I was sitting at my writing-desk, and the animal was playing about in the open part of its cage, a large blue fly happened to buzz against the wires. The little creature, although at twice or thrice the distance of her own length from it, sprang along the wires with the greatest agility, and would certainly have seized it, had the space between the wires been sufficiently wide to have admitted her teeth or paws to reach it. I was surprised at this occurrence, as I had been led to believe that the Harvest Mouse was merely a granivorous animal. I caught the fly, and made it buzz in my fingers against the wires. The mouse, though usually shy and timid, immediately came out of her hiding-place, and running to the spot, seized and devoured it. From this time I fed her with insects whenever I could get them; and she always preferred them to every other kind of food that I offered her." Mr. Macgillivray figures one in the coils of an earth-worm which it devoured, though the worm at first upset it by twisting round its body.

Col. Montagu failed to keep it in confinement, but it has been so kept, The Rev. W. Bingley and Mr. Broderip observed that the tail is in a degree prehensile. The latter had a pair in a dormouse's cage for some time, and frequently saw them coil the end of their tails round the bars, especially when they were clambering along the sides or on the top of it. They became very familiar, soon recognised their friends, and would lie down or rear themselves up to be tickled with a straw or a pen, an operation which they evidently enjoyed much.—*Penny Cyclopædia.*

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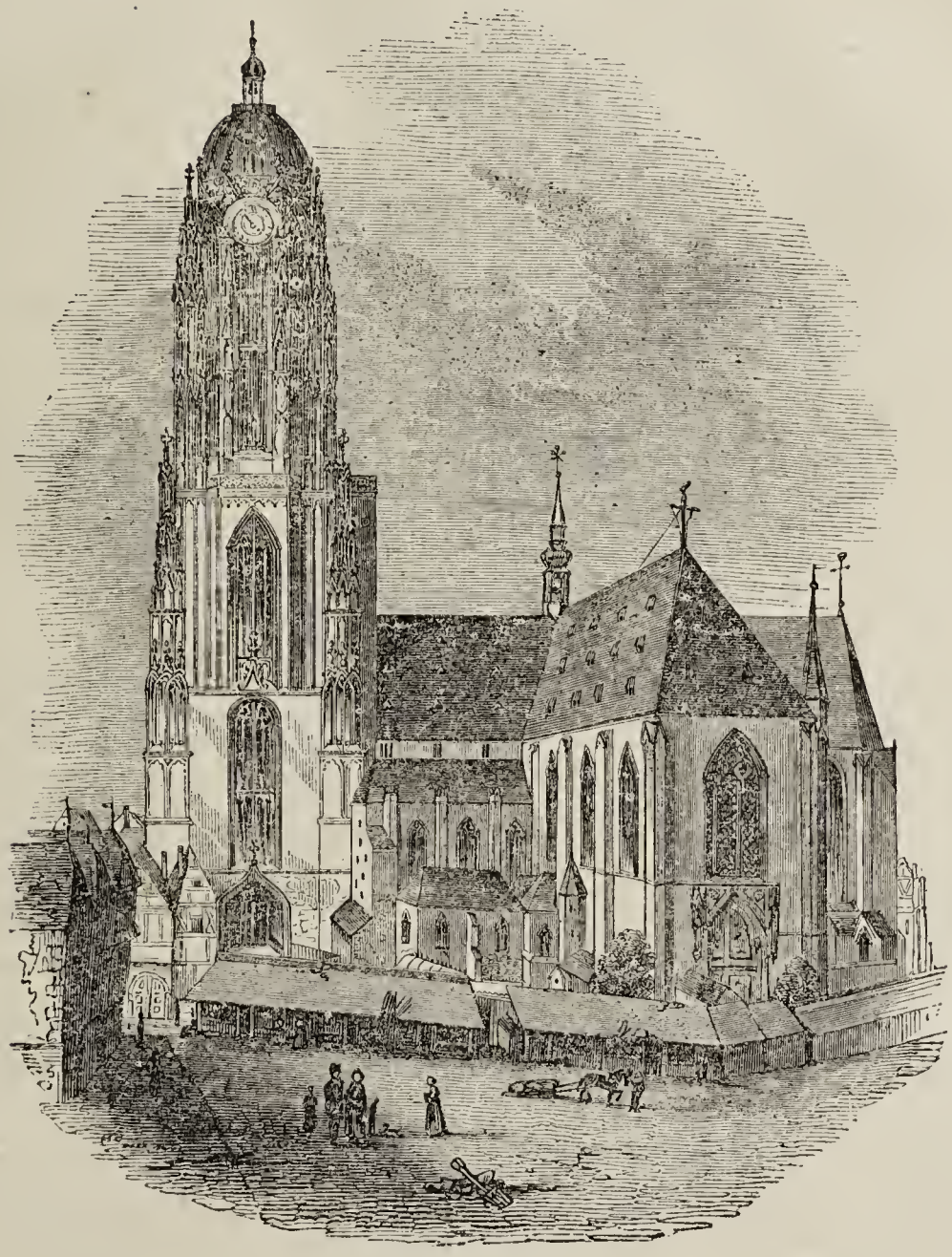
FRANKFORT-ON-THE-MAIN.



[Cathedral, Frankfort.]

FRANKFORT-on-the-Main, formerly an Imperial city, at present the principal of the four free cities of the Germanic Confederation, and the seat of the Diet, is situated in 50° 70′ N. lat. and 8° 37′ E. long. The river Main divides it into two unequal parts, Frankfort Proper being on the right or northern bank, and the suburb called Sachsenhausen lying on the left; these are connected by a stone bridge 330 paces long, supported by fourteen arches. The plain in which the city stands is fertile and well cultivated, and is bounded on the north by a fine range of mountains called the Taunus; some of the hills which compose this ridge rise to a considerable height, the highest, called the Feldberg, being 2760 feet high. On the south or left bank of the river, the country rises into fine sloping hills, forming the forest lands belonging to the city. The climate is healthy, and generally mild, but subject to variations, particularly in the spring, which is frequently cold and backward, from the prevalence of north and easterly winds. The water is good, but hard and impregnated with lime, and the neighbouring country abounds with mineral springs of various properties. Four old watchtowers, placed on the four principal roads, about half a league from the town, indicate the ancient limits of its territory. The town itself had been for ages surrounded with fortifications, consisting of walls, towers, gates, and a ditch; but, in 1806, M. Guiollet, then burgomaster, conceived the plan of levelling these useless fortifications, and of converting the site on which they stood into gardens or promenades for the public. His praiseworthy design was adopted and carried into effect, and in 1813 Frankfort could boast of a cincture of garden-grounds laid out in the English style, perhaps nowhere surpassed. The ramparts became the site of new streets, consisting of tasteful and splendid edifices overlooking the promenades and circumjacent country, having their private gardens where the ditch was, which being filled up (except a very narrow part or chasm that serves to divide these private gardens from the public ones formed upon the glacis), offers to the eye an extensive breadth of pleasure-grounds. The land beyond the glacis, separated from the promenades by a drive or carriage-way, is now covered with elegant villas and well-

cultivated gardens. Of the old narrow gates only two are left; one of which, called the Eschenheimer, is preserved for the sake of its fine old tower, crowned with five tourelles, or small towers, on its top, and which serves as a specimen of the taste of the fourteenth century. The other gates, opening on the principal roads, were converted into spacious and handsome entrances, having on one side of the barrier of pallisades a guard-house and on the other a toll-house. Upon the decease of M. Guiollet, his fellow-citizens erected a monument to his memory, consisting of his bust upon a pedestal, under which are figures and groups in relief, representing the demolition of the walls and the substitution of trees, &c. This handsome monument is placed in the public walks opposite to the house of his co-operator, M. Rintz, to whose taste and skill as town gardener the public is indebted for the shady walks, cool retreats, and beautiful parterres that compose the gardens.

Although in so ancient a city a number of narrow streets and old ugly houses must necessarily be found, yet perhaps no city in Europe can boast of a larger proportion of good streets and elegant houses, combining in their structure solidity with lightness, to which appearance the number of windows, and the exterior being painted of a lively colour, greatly contribute. The principal streets are the Zeil, the Sehönes Aussieht or Belle-vue by the Ober-main Thor (or gate), and that by the Untermain Thor, at the other extremity, both looking upon the river and the country on the opposite side; those built upon the ramparts, the Buchgasse, the Grosse Kirschgraben, and the Eschenheimer Strasse. Squares—the Rossmarkt (horse-market), the Parade, the Römerberg, and the Liebfrauenberg. The most remarkable ancient buildings are—1. The Römer, or Town-hall, an irregular building, or rather collection of buildings, purchased by the council or government in the fifteenth century, and which had formerly been used as a storehouse by the Lombard merchants. In a hall in this house the senate holds it sittings; it is called the Kaisersaal, in which the emperors once were elected, and in which are the portraits of all the emperors from Conrad I.; and in the archives is a copy of the famous Golden Bull, published by Charles IV. in the fourteenth century. 2. The Saalhof, a palace built by Lewis the Pious, in 822, the only remains of which is a chapel called by the above name, and which is the most ancient edifice in the town. 3. The arsenal, situated in the Zeil, the upper part of which is converted into prisons. 4. The ci-devant convent of the Carmelites, one of the cloisters of which is ornamented with paintings in fresco of the sixteenth century. This place is now converted into a barrack. 5. The palace of the Teutonic knights, in Sachsenhausen, at the foot of the bridge, belonging to their present grand-master the archduke Maximilian of Austria, and occupied as a barrack by Austrian soldiers. 6. The Steinhaus, now serving as a storehouse. To these may be added the Braunfels, the rooms of which are converted into bazaars during the fairs. In the court of this building the Exchange has been hitherto held; but a new Exchange is now being built. Here may be also mentioned the fine palace of Taxis, built about 1730, greatly admired for its structure, and likewise for its statues and paintings on the walls. Among the modern public buildings the most beautiful are the Library, erected at the Ober-main Thor, and the Hospital of the Holy Ghost; together with the Orphan Asylum and the theatre, to which we shall revert in noticing the public institutions.

Of the churches extant, and now in use as such, are: Lutheran churches—1, St. Paul's; 2, St. Catherine's; 3, The White Ladies'; 4, St. Peter's; 5, that of the Holy Ghost, attached to the hospital of that name; and 6, that of the Three Kings, in Sachsenhausen.

There is also a church belonging to the Calvinists, and a French Protestant chapel,

Roman Catholic churches:—1, The cathedral of St. Bartholomew; 2, St. Leonard's; 3, Our Lady's; and 4, the chapel adjoining the palace of the Teutonic knights, in Saehsenhausen.

Of the above-named churches the most interesting are the following:—

St. Bartholomew's Cathedral is built upon the site of a chapel founded in the time of the first Carlovingian emperors. The present edifice was begun in 1415, and constructed in the form of a cross, with one tower, which after having been raised to 160 feet (about two-thirds of its intended height), was, in 1509, through want of funds, discontinued, except being covered with a round cap, evidently intended as a temporary defence. It is now intended to finish this tower. The cathedral, as being the place of election of the Roman Kaisers (as the emperors of Germany were styled), has always remained in the possession of the Roman Catholics. It contains the tomb of the emperor Guenther von Schwarzburg, the successful rival of Charles IV., and who died in 1349, six months after his election, not without strong suspicions of having been poisoned at the instigation of his rival, who immediately succeeded him. The other monuments, as also the sculpture of the stalls, are worthy of notice.

The church of St. Leonard occupies the ground on which stood the palace of Charlemagne. Above St. Leonard's altar is a finely executed picture of the saint.

St. Catherine's church has a handsome tower, and the interior contains the tombs of the celebrated scholars H. Ludolf and Z. K. Uffenbach; the sides are decorated with monuments.

St. Paul's church is built of red hewn stone, and forms an oval of 132 feet in length and 108 in breadth; the tower, which is small, and disproportioned to the noble dimensions of the church, was not finished till 1832.

The French Protestant chapel is remarkable for its tasteful structure; the front is ornamented with Corinthian pilasters; the interior, corresponding in order, is most elegantly formed; the pulpit, constructed of marble, is a masterpiece of taste. In this chapel the Church of England service is performed every Sunday at noon, to a numerous and respectable congregation of English residents and travellers.

There are at present but two synagogues for the entire Jewish population of the city; a new one, however, is being constructed, much larger and more commodious than those now existing.

Independently of the general consistory and commissions charged with all that concerns the Lutheran religion, its churches and schools, each Christian community has its own consistorial committee. The Catholic communion is attached to the diocese of the bishop of Limburg.

Besides the churches now in use for divine service, several are converted into warehouses; the most remarkable of these is that of St. Nicholas, with its handsome octagon tower; this was given up on account of its insecurity, but is about to be repaired and reconsecrated as a Lutheran church. The others are the chapel of the Saalhof; that of St. Michael; and the churches of St. John, the Dominicans, and the Carmelites.

The new cemetery lies about an English mile to the north of the city, and contains about twenty acres of ground. It has a superb entrance facing the west, commanding a fine view of the Taunus and the intervening valley. The grounds are laid out tastefully in shady walks, among which are tombs and monuments of great taste and richness; but along the partition on the eastern side, which separates the Christian from the Jews' burial-ground, is an aisle running the whole breadth of the ground, under which are the vaults of the most distinguished families. The sculptures and reliefs by Thorwaldsen are justly admired. The Jewish cemetery is smaller and very plain. Sachsenhausen, like Frankfort, abounds

in benevolent institutions; the chief of which are: 1. The Hospital of the Holy Ghost, established for the reception of poor strangers, such as servants, &c., who are relieved and treated gratis. 2. The Senkenberg Hospital, which, with its medical academy, was founded and endowed in 1763, by Doctor Senkenberg, for the relief and treatment of poor sick citizens. To this hospital is added the fund bequeathed by the senator Brönnen, for the support of six old persons during their lives. 3. The Alien Hospital; connected with which is the hospital for epileptic patients. 4. The Jews' Hospital. 5. The Orphan Asylum, which contains from 90 to 100 boys, and from 50 to 60 girls, who are maintained and educated. 6. The Charity-house for the reception and maintenance of the aged poor. Besides these establishments there are a number of foundations without public buildings, the object of which is to give pecuniary relief to the indigent.

Among the establishments for the promotion of education, and in favour of the sciences and arts, are, first, the different public schools, namely, the gymnasium, the normal school, the St. Catherine's school, that of the White Ladies, the Catholic schools for both sexes, and the Jews' schools. Next in order are: 1. The Public Library, already mentioned as a noble edifice. It contained in 1830 upwards of 50,000 volumes, many of which are rare editions; also a great number of Egyptian, Greek, Roman, and German antiquities; but the numerous accessions it has since received have considerably enriched it. It is open to the public four days in the week. 2. The Medical Academy of Senkenberg, attached to the hospital above mentioned. It has an anatomical theatre, in which lectures are given gratis; a botanical garden, and a noble collection of natural curiosities, chiefly presented to it by M. Edward Rüppel of Frankfort, which he had collected during a residence of several years in Egypt and Nubia. The public is admitted freely on Wednesdays and Fridays. 3. The Society for the Encouragement of Physical Science, as chemistry and natural philosophy. This institution has a fine laboratory, furnished with a great variety of instruments for the use of the members and amateurs. Public lectures are given in it; and diurnal observations of the atmosphere are made and recorded, the results of which are regularly published in the Frankfort newspapers. 4. The Polytechnic Society, composed of members taken from all classes of the citizens. This society instituted in 1818 a Sunday-school for workmen and a savings'-bank, both of which are in a prosperous state. 5. The Staedel Academy of Painting, Design, Engraving, and Architecture; founded by M. Staedel, a banker, who, dying in 1816, bequeathed his numerous collection of paintings and engravings, together with several houses, and a capital of above 1,200,000 florins, for the founding of this institute; and confided the direction of it to five trustees, with the power of nominating their successors. The principal objects of attention are the pictures by Flemish, German, and Italian painters; and the fine models in plaster of the bas-reliefs of the Parthenon, and of the temple of Apollo at Phigalia; besides these, pictures by native artists are constantly exhibited. In the room set apart for the exhibition of engravings, the collection of which is very numerous, may be seen the entire works of Albrecht Durer, and copies of the fresco paintings of the Vatican by Raphael. The private collections of objects of art are:—the Museum of M. Bethmann; the collections of paintings, &c. of MM. Passavant, Schneider, Brentano, Willmans, Jugel, G. Finger, Prehm, and others.

The theatre, dedicated to the performance of operas, tragedies, and comedies, is distinguished by its excellent orchestra, and the singers and performers are among the best in Germany; but an English spectator will not think much of the lighting, decorations, and scenery. The Society of St. Cecilia is an amateur assembly of vocal and instrumental music; its concerts are much frequented. To these places of public amusement must be added the public garden called the Mainlust, a miniature Vauxhall, and the principal place of resort on summer evenings. It is situated on the bank of the river; numerous tables are placed under shady trees; an excellent band plays during the evening, and refreshments are served at a very moderate charge.

The hotels in Frankfort are among the best in Germany. The principal, and which during summer are always filled with English travellers, are the hotels De Russie, D'Angleterre, and the Roman Emperor. The Weidenbusch, the White Swan, the Landsberg, and the Hotel de Hollande are also good inns, with excellent accommodations, at moderate charges.

Frankfort is surrounded by villages, most of which are under its jurisdiction and within its territorial domains. The principal ones are, Bornheim, on the north; Roedelheim and Hausen, towards the west; and Oberrad and Niederrad on the south side of the river. On the west of the city lies the neat town of Bockenheim, which, though not belonging to Frankfort, is within a mile of it. These, with the Forsthaus, the Riedhof, and the Sandhof, lying in or near the forest on the south side of the river, are places of resort in summer for the Frankforters. The Whitsuntide festival, held in the forest, is attended by many thousands of persons, forming family and convivial parties; bands of music stationed in different parts, add their harmony to the lively scene.

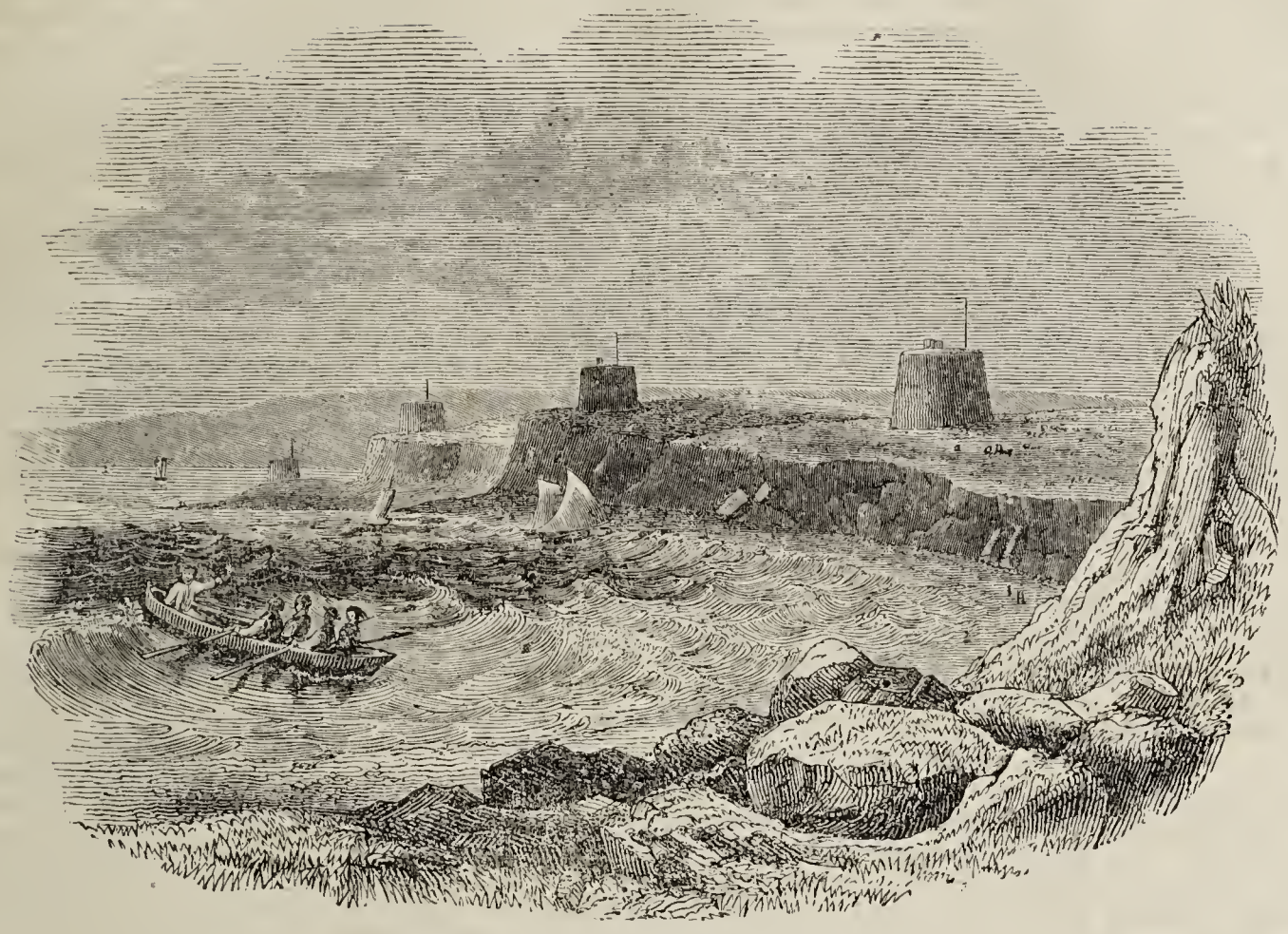
Owing to the fertility and excellent culture of the soil, corn, vegetables, and fruit are abundant, and moderate in price. The market is likewise well supplied with good beef, mutton, veal, and pork; fish, however, is very dear, the only kinds being what the rivers supply: salted sea-fish may be had by paying a very high price for it.

Frankfort has, from the earliest periods of its history, been a place of considerable importance, on account of its position. By the accounts of its historians it owed its first existence and name to a fortress or watchtower, built at the *furth*, or ford, across the river by the Franks, who succeeded the Romans in the subjugation of the territory, to prevent the incursions of the Alemanni. Hence it was called Frankenfurth, or the Ford of the Franks. The earliest accounts extant, which date 794, state that Charlemagne built an imperial palace here, and gave encouragement to cultivators and fishermen to settle on the spot. It is also said that he established on the left bank a colony of Saxon captives, with their wives and children, whence the name of Sachsenhausen, which that quarter of the city bears. About the middle of the fourteenth century the town began to assume the form and size, as to the extent of its walls, that it now has; fortifications arose around it, and towers were built. From 1147 it had been by custom the place of the election of the German emperors, and in 1356 it had that privilege confirmed by an article in the Golden Bull, although at a later period Aix-la-Chapelle was appointed the place for the coronation. In 1240, Frederic II. granted a charter for an autumnal fair, and Louis V., in 1330, granted another charter for a fair to be held in Lent. To these and numerous other privileges, and to its situation, may be attributed the trade which has distinguished this city ever since, and which has frequently enabled it to recover its opulence after the greatest disasters that marauders, war, and pestilence could inflict upon it. The earliest trade carried on by the citizens appears to have been in linen and woollen cloths, which was greatly extended through the privilege of coining. After the discovery of printing, the book trade flourished. As a central depôt for merchandise it is the first in Germany; its dealings in commission and agency, and in exchange transactions, are of the greatest importance. The railroad laid down between this town and Mayence, by increasing the facility of transport, cannot fail of adding to the opulence it enjoys.

Frankfort was, from 1254, a free imperial city until 1806, when it was made over to the prince primate, a vassal of Napoleon Bonaparte, Karl von Dalberg, who was then created an archduke, and of whose dominions this city was made the capital. His territories comprehended Aschaffenburg, Fulda, and Hanau. After the overthrow of Napoleon Frankfort was declared one of the free cities of the Germanic Confederation, and appointed to be the seat of its diet. It adopted, on the 18th of July, 1816, a democratical constitution, upon the principles of its former state as an imperial city. Its territory without the city comprises a circuit of four and a half German square miles, with about 10,000 inhabitants. The population of the city, according to the census of 1838, is about 54,000, of whom upwards of 12,000 are Roman Catholics, and there are nearly 7000 Jews. The supreme power is in the hands of the Christian inhabitants. The legislative body consists of twenty senators, twenty members of the permanent council, elected by the citizens, and forty-five citizens chosen annually. At the head of the executive are two burgomasters, chosen yearly by the senate. The police is well appointed, and rigid in its regulations; it takes cognizance of the arrival and place of abode of every individual. The exterior is guarded by a rural police, whose business it is to prevent the lurking about of vagrants, and to protect the gardens and property in the environs; this and the constabulary are amply sufficient for the security of property; for, owing in a great measure to the generally good education and consequent morality of the people, robberies are of rare occurrence. The city keeps up a force of about 700 soldiers, and furnishes a contingent to the Confederation of 475 men. Some few years ago, an attempt was made by some misguided young men, not inhabitants, to take Frankfort by surprise. As this attempt seemed to have been made with a view hostile to the Confederation, a battalion of Austrian infantry and a company of Prussian artillery have ever since been stationed in the town, and with the civic troops are sufficient for the garrison duty. The fortifications of Mayence were also strengthened, and every precaution taken to prevent a repetition of similar attempts.

Proper Objects of Geography.—Geography, in its present state, and in its practical application, has for its object the determination of all those facts, as to any given country, which will enable us to judge of its fitness to provide man with food and to promote his civilization. As a science, its object is to deduce, from all the observed phenomena within its sphere, those general principles which enable us, from certain known facts as to any given country, to infer others not ascertained, and which indicate what are, as to each portion of the earth, the proper objects of inquiry. It is not every part of a country that possesses equal advantages for the habitation of man. Some parts are more favoured by soil and climate than others. There are also tracts which are inferior in both respects, but by the aid of other advantages, especially those of easy communication, have risen to a higher degree of prosperity and cultivation than many others in their neighbourhood which are more favoured in soil and climate. No correct knowledge of a country can be acquired unless the parts of it which are distinguished by their natural advantages or disadvantages are separated from each other, and unless a particular description is given of each, with its extent, and the proportion which it bears to the whole country. The first business of the geographer, then, must be to make this separation. His next business is to give a particular description of each of these natural divisions, beginning with the most essential fact, its elevation above the sea. If it is a valley, he notices its elevation at its origin and its termination, observing where its descent is regular and gradual, and where it declines with greater rapidity. If it is a plain, he notices at least its mean elevation, and observes in what cases it extends in a flat level, and in what cases it has an undulating surface; also, if a smaller or larger portion of it is covered with swamps. This description of the surface is followed by that of the watercourses or drainage. After determining the sources of a stream, and the direction and length of its course, he mentions the amount of depression of its bed below the general surface of the valley or of the plain; and when it drains a plain, if there are bottoms or river-valleys formed on the surface of the plain, he mentions also the general extent of these bottoms. The distance to which a river is navigable is the next object of inquiry: if there are any natural impediments to the navigation, and if any successful attempts have been made to remove them, these facts also require mention. The extent of surface drained by each river, or by all the streams which ultimately unite in one channel, or in other words, the extent of each river-basin, must also be ascertained. Next follows the climate. Here two points especially are to be attended to; the temperature of the air, and the quantity of rain which falls and of moisture in the atmosphere. As for the temperature of the air, not only the mean annual temperature is to be given or ascertained, but also that of the different seasons, and the regularity or irregularity of its changes, as such changes generally affect the health of the inhabitants in a sensible degree. As to moisture or rain, not only the annual quantity that falls should be noticed, but also its distribution at the different seasons. The character and the duration of the seasons must also be observed, and the prevalent winds; and especially the effect of the seasons on the progress of vegetation. It is necessary to know all these facts before a just notion can be formed of the fitness of any given tract of country for providing a population with food; and this capability of a country for the production of food, or in other words, its capabilities for agricultural purposes, is one of the most useful branches of geographical inquiry. The nature of the soil and its fitness for different productions adapted to the climate of the tract are therefore matters of primary importance in a geographical description. It is here proper to enumerate those objects of agriculture which are raised for food and as materials for clothing, and the proportion between the labour which they require and the value of the produce: and in the next place such productions as could be raised with ease and advantage, but which are not cultivated to any extent. Those objects which form articles of export, and enter into the market of the world, also claim a notice; and also such indigenous plants as are either of some use in the domestic economy of the inhabitants or furnish a commodity for foreign trade. It is not the business of the geographer to enumerate all the particulars which constitute the botany or zoology of a district, for that would enlarge his science beyond all bounds and encroach upon the limits of others. The principle that must guide him in determining how much and what he must include in his geographical description of the botany and zoology of a country, will always be indicated by the question—does the thing or object inquired after materially influence the capability of the country as a place fitted for the residence of man? Besides the useful domestic animals, it is only necessary to mention such wild ones as are useful to the inhabitants, either by providing them with food and clothing, or by supplying an article of commerce; and these animals only need be mentioned when they are found in great numbers. As for the mineral wealth of a country, the notice of that will be limited to those substances which are worked for the use of the inhabitants or for exportation. . . . . As to statistical facts, the greatest caution ought to be used. Most of them are of such a description that they are true only for a very short time, and then lose that character. Such things, according to the opinion of Strabo, ought not to be received among things which are of an entirely different nature. Yet the knowledge of a country would properly be considered as incomplete without a general notion of the most commercial and manufacturing towns within it. Such towns must therefore be mentioned, and at the same time it should be stated how far they facilitate the internal and external intercourse of a country. . . . . The political divisions of the country may be added or omitted; when added, they should be mentioned briefly, and in a very general way. Good maps supply any deficiency in geographical works in this respect. The political institutions of a country belong to its history, and not to its geography, and ought certainly to be excluded from geographical treatises, though they form a necessary part of most statistical and of all historical works.—*Penny Cyclopædia.*

SMUGGLING.



[Martello Towers, near Pevensey Bay, Sussex.]

During the last war, government erected Martello towers in many parts of the southern coast. They were placed at distances of about a quarter of a mile from each other, and were intended to serve as a defence in case of an invasion from France. The name is derived from Martello, in Corsica, where a strong tower enabled its defenders to maintain a determined resistance against a superior English force, in 1794. The Martello towers erected in Kent and Sussex are circular, with bomb-proof walls of great thickness, and on the top there is a place for a single gun, with a parapet of sufficient height to afford protection to the men employed in working it. A deep fosse surrounds each tower, and the entrance is by a door several feet from the ground, the approach to which, being by a ladder, can be easily cut off. During the first half of the war a sum of nearly 900,000*l*. was expended in erecting and repairing fortifications and Martello towers on the southern coast, not including Portsmouth. Happily the utility of the Martello towers was never put to the proof in the manner anticipated, and they have since been made use of by the officers employed in the protection of the revenue.

A considerable portion of the coast-line of Kent and Sussex, to which at this season so many visitors resort from the metropolis, consists of high chalk cliffs, which rise with an abrupt elevation, and seaward present the appearance of a rampart. These chalk cliffs induced the Romans to give the name of Albion to our island. In Kent, the cliffs extend from Walmer Castle, near Deal, to Sandgate, between Folkstone and Hythe; but they are interrupted occasionally by depressions, such as the one in which Dover is situated, where the chalk hills present a transverse section to the sea, and a valley runs for several miles into the interior. Beachy Head, in Sussex, at a short distance from Pevensey Bay, is the highest point of land on the south coast, being 564 feet above the level of the sea. Here the South Downs may be said to have their commencement, extending along the coast for twenty-eight miles, until they gradually recede from the sea and stretch into the interior. On the west side of the cliffs at Beachy Head is a cavern containing two chambers, called Parson Darby's Hole, from it having been inhabited two years as a hermitage by a clergyman.

From the earliest records it appears that the sea has been gradually encroaching on the Kent and Sussex coasts. Between Dover and Folkstone a portion of the chalk cliffs has fallen forwards towards the sea, so as to present an undercliff similar to that at the back of the Isle of Wight; and in 1813 a mass of chalk, three hundred feet in length and from seventy to eighty feet in breadth, fell from Beachy Head, and similar slips have since been frequent. At Pevensey, however, the case is exactly the reverse, for here the land has been silently gaining on the sea. Pevensey was a seaport in the Saxon times, and William the Conqueror landed here with his invading army. It was probably a place of some consequence under the Romans, for the castle, which once enclosed an area of seven acres, contains considerable quantities of Roman bricks, the remains, perhaps, of a Roman fortress. As the sea deserted the ancient port, the prosperity of Pevensey declined, and at the last census it did not contain three hundred inhabitants, though once it was doubtless the chief town in the hundred to which it gives its name.

The local situation of Pevensey gave it many advantages in the commercial intercourse which was maintained between England and Normandy after the Conquest. In the case of this port we may be content to see it blocked up by the hand of nature working silently for centuries; but in other ports of the southern coast, equally or more favourably situated for trade with the opposite Continent, it is lamentable to reflect that their maritime industry has been repressed, or perverted and rendered a source of demoralization by wilfully acting against the clearest dictates of common sense. So long had commercial legislators nourished the belief that they could encourage trade by prohibitions and restrictions, that these artifices have come to be looked upon as the natural causes of its prosperity, and the inclination to revert to the system which is really natural has been condemned as absurd and dan-

gerous. In such a state of things the smuggler steps in to redress, at the peril of the morality of whole districts, the blunders and errors of vicious commercial legislation. Nowhere can he find a more favourable situation for his operations than the coasts of Kent and Sussex, and hundreds of stories are current in those parts of their skill and address, their ingenious schemes, their caution in running contraband goods ashore, their alacrity in hoisting them up the side of the cliff by tackle, and the expedition with which they are hurried inland to a place of security. These adventures infect a whole population with a dangerous spirit of heroism which renders the ordinary and quiet pursuit of industry insipid, and thus deprives those who engage in them of the best foundations of good character and respectability.

In Johnson's 'Dictionary' a smuggler is stigmatised as "a wretch who imports or exports goods without payment of customs;" but the lexicographer had forgotten that in his explanation of the word "excise" he had described it as "a hateful tax," though it is paid now with less reluctance than any other, and that the heinousness of offences diminishes in general estimation in proportion to the unpopularity of any law. High and extravagant duties render the smuggler a popular character, and he cannot be brought to look upon himself morally as a criminal, while his neighbours view him in the light of a benefactor who supplies them with necessaries and luxuries at a cheap rate. "Not many people," says Adam Smith, "are scrupulous about smuggling, when, without perjury, they can find any easy and safe opportunity of doing so. To pretend to have any scruple about buying smuggled goods would in most countries be regarded as one of those pedantic pieces of hypocrisy which, instead of gaining credit with anybody, serve only to expose the person who affects to practice them to the suspicion of being a greater knave than the rest of his neighbours." It even happens that many persons attach a fictitious value to goods which have been smuggled; and this weakness is often practised upon by those who offer goods for sale as illicit which have passed through all the forms of the customs or excise laws. The crimes which are the offspring of smuggling are in fact more to be dreaded than that of smuggling itself. The science of taxation has its moral as well as its economical bearings; and it has been well observed by a writer in the 'Edinburgh Review' (vol. xxxvi., p. 536), that "to create, by means of high duties, an overwhelming temptation to indulge in crime, and then to punish men for indulging in it, is a principle wholly and completely subversive of every principle of justice. It revolts the natural feelings of the people, and teaches them to feel an interest in the worst characters, to espouse their cause and avenge their wrongs." All experience proves that it is totally impossible to put an end to smuggling, so long as a profit can be made by it; while the instant the proper remedy is applied it ceases. Everybody has probably had personal experience of the attempts to evade postage before the recent alteration in the rates, while such practices have since suddenly become as rare as they were formerly universal; but several equally strong cases are worthy of being stored up as examples in support of an unalterable truth.

Previous to 1784 the duty on tea was raised by successive additions to 119 per cent., and the quantity smuggled rose to eight million lbs. per annum. The merchants were compelled to adulterate the teas purchased of the East India Company, or they must otherwise have been beaten out of the market. Fortunately, in October, 1784, the duty was reduced to 12 per cent., and the consequence was, that while in the preceding year there had been only $5\frac{3}{4}$ million lbs. sold at the Company's sales, the quantity sold in 1785 exceeded $16\frac{1}{4}$ million lbs.

In Ireland, in 1811, the duty on spirits being 2*s.* per gallon, $6\frac{1}{2}$ million gallons paid duty; but in 1822, when the duty had been increased to 5*s.* 6*d.*, only $2\frac{1}{4}$ million gallons were brought to charge, though it was tolerably well known that the consumption amounted to about 10 million gallons. In October, 1823, the duty was reduced to 2*s.*; and in 1825 the quantity charged with duty was $9\frac{1}{4}$ million gallons; but what was much better, the dreadful evils resulting from illicit distillation and smuggling, and which were described by a clergyman in a pamphlet as worse than the calamities of civilised warfare, had almost entirely ceased.

Scotland presents a similar case to the above. In 1821, in consequence of the duty being so high, about 2 million gallons of spirits were illegally distilled; and smuggled whiskey was sold in the open market, under the protection of armed men acting in open violation of the laws. On the duty being reduced, smuggling and illicit distillation ceased, and the revenue increased. This change took place in October, 1823, and the number of gallons paying duty rose from $2\frac{1}{4}$ millions in 1822 to nearly 6 million gallons in 1825.

In 1822 and 1823 the country was at an enormous cost to prevent smuggling. For this purpose the Preventive Service and the Coast Blockade were organised, and the vessels of the royal navy were in active co-operation with a fleet of fifty-two revenue cruisers. In the above two years the total captures on the coasts of England was 52 vessels and 385 boats. The Coast Blockade Service was performed on shore by about 1500 officers and seamen belonging to the navy, and under the orders of the Admiralty. The Coast Guard is another name for the body of men who perform this service under the authority of the Board of Customs. For the *half* year ending 5th April, 1823, the direct expense of the service for the prevention of smuggling in England was as follows:—land-guard, or riding officers, 9444*l.*; preventive water-guard, 63,964*l.*; revenue cruisers, 45,448*l.*; coast blockade, 451*l.*; total, 119,398*l.*: Scotland, 16,020*l.*; Ireland, 91,727*l.*: grand total for half a year, 227,145*l.* The seizures made during this period amounted to about 67,000*l.* Frequent conflicts ensued between the officers of the revenue and smugglers, the latter assisted by large bodies of the country-people; and scarcely a week elapsed without lawless encounters more or less serious. No material improvement took place for several years. The counties of Cumberland and Northumberland were rapidly becoming demoralised by the practice of smuggling Scotch spirits into England, where the duty was much higher. Impolitic as are the high duties imposed by one country upon the productions of its neighbours, different rates of duty on the same article in one country are still worse. In two years 163 informations were laid in the above two counties for offences against the smuggling laws, and in 110 cases the parties were committed to prison. In 1830 there were in England 116 persons under confinement for smuggling, and 64 persons were serving in the navy as a penalty for this offence. In 1831 the Coast Guard, substituted for the Coast Blockade in Kent and Sussex, cost the country 83,636*l.* per annum; and upwards of 181,000*l.* had been expended in 1832 in building cottages for the accommodation of the officers and men. In 1830, Sir Henry Parnell, in his work on 'Financial Reform,' estimated the total cost of protecting the revenue at 700,000*l.* or 800,000*l.* a-year.

Within the last twelve years there has been a manifest improvement in the tendency of our commercial policy, and spirits and tobacco are now the two principal articles which allow a considerable profit to the smuggler, a duty of 22*s.* 6*d.* per gallon on the former, and of 3*s.* per lb., or 900*l.* per cent., on the cost price of the latter, being amply sufficient to cover the expense of insurance so as to render his calling one of nearly as little risk as the legal trade. Three-fourths of the tobacco consumed in Ireland is believed to be supplied by smugglers. Taking

the consumption at a period when the duty was 8*d.*, and estimating the subsequent increase of population, there should be 16 million lbs. of tobacco consumed in Ireland; whereas a few years ago, the duty being 3*s.*, the consumption was only 4 million lbs. Of course the revenue and the fair trader suffer greatly; but the only remedy is a reduction of duty, so as to annihilate the profits of the smuggler.

Latterly also an important principle in taxation has received the attention that it deserves, namely, that in matters of revenue, "two and two do not make four;" and increase of the revenue has been sought by means of the reduction of duty rather than by making additions to its amount. Thus, in consequence of the reduction of duty, the price of soap has fallen one-eighth, and the consumption has increased one-third; tea has fallen one-sixth, and the consumption is greater by one-half; silk goods are one-fifth lower, and the quantity consumed is more than doubled; coffee has fallen one-fourth in price, and more than treble the quantity is consumed. The commerce of the country has thus been increased, and the comforts of the people materially enlarged, without any loss to the revenue, while illicit practices and their demoralising effects have been greatly diminished.

HORSE ARMOURY IN THE TOWER.—VIII.

Charles Brandon, Duke of Suffolk; and Edward Clinton, Earl of Lincoln.

As the progress of knightly costume in England is sufficiently exhibited by the armour worn by the monarchs who successively occupied the throne, it will only be necessary to give representations of those figures in the Tower which are habited in the arms those princes are supposed to have worn. Thus, having spoken of the armour worn by Henry VIII., it will be unnecessary to describe the suits of Charles Brandon, Duke of Suffolk, and Edward Clinton, Earl of Lincoln, whose effigies present us with armour of nearly the same fashion and of the same date, and precede that of Edward VI., the next monarch who sat on the English throne. Some account, however, of these personages may be looked for by our readers, and will be necessary to render our guide to the Horse Armoury in the Tower complete. We shall therefore, before describing the fashion of armour of the time of Edward VI., devote a few lines to the lives of those two noblemen, who, occupying so distinguished a place in the history of chivalry, deserve not to be passed over without a word.

Charles Brandon, Duke of Suffolk, was the son of Sir William Brandon, a gentleman who had early espoused the cause of Henry VII., for whom he not only left his country that he might share his exile in Brittany, but forfeited an ample patrimony, and at last fell fighting by his side in Bosworth Field, where he bore the standard of the house of Lancaster, and where he met his death by the hand of Richard himself. On the death of his father, Charles Brandon became a ward of the crown, and was treated by the king almost as one of his own sons. He was educated at court with the young princes, and, with the sanction of the king, became one of the most intimate of the companions of his son Henry (afterwards king), who, although some years his junior, contracted with him a friendship which increased with their years. When Henry ascended the throne, Charles Brandon was the most favoured of his courtiers, and was constantly in his society. "With a sufficient understanding," says Lodge, "for higher spheres of action, he seems, and indeed in such a reign it was a proof of his sagacity to have adopted by choice the character of a mere courtier; but he moved in it with a rare dignity; and envy, malice, and duplicity seemed to have been unknown to him." Possessing a fine person, an agreeable address, and a sparkling wit, which he knew well how to temper with discretion—skilled in all the courtly exercises of the day, and honoured with the confidence of the king, Charles Brandon rapidly rose to distinction; and by avoiding all interference with religion and politics, the rocks on which so many in that hazardous reign ruined their fortunes, he contrived to maintain his place in the king's friendship to the last. Yet his life was not passed wholly in the amusements and frivolity of the court. When the warlike demonstrations of the French opened a greater field for the "exercise of arms" than the tilt-yard, to which the exhibition of military skill had for some time been confined, Charles Brandon rendered himself as distinguished for courage and bravery as he had hitherto been for his courtly manners. He was present in the desperate action with a French squadron, which occurred early in the spring of 1513, off Brest; and shortly afterwards greatly distinguished himself in the successful siege of Therouenne, as well as in the famous battle of Spurs, so called, not from any allusion to the flight of the French, but from the village of Spours, near which it was fought.

In this engagement he commanded the vanguard of the English army, and fully justified his title to be considered the first soldier as well as the first gentleman of the age. He then marched with the king into Flanders, and having reduced Tournay, met the emperor Maximilian at Lisle, where they were splendidly entertained.

For his services in this campaign the king created him Viscount Lisle, and afterwards Duke of Suffolk.

In 1514, on the marriage of Louis XII. of France, to the princess Mary, second sister to Henry VIII., the Duke of Suffolk was sent, with the flower of the English nobility, to grace the nuptial festivities; and it has been said that his courage and address in the jousts which formed part of the celebration, and which chanced to be contended with more than usual fierceness, first captivated the affections of the queen, and induced that romantic attachment which in its consequences was of such importance to the fortunes of the duke.

There is, however, every probability for the belief that a reciprocal attachment had long subsisted between them; and that the princess Mary was in no way ambitious of the marriage to the king, which has been described as "a political union of youth and beauty to debilitated old age." In fact the king was already on the brink of the grave, for he died in less than three months after his marriage. Within a very few days after, the young dowager-queen was secretly married to the Duke of Suffolk, which, when it became known, caused Henry to evince a slight degree of resentment, though it was not perhaps altogether distasteful to him. Several influential parties, however, exerted themselves to obtain his pardon, and being by their representations soon appeased, he gave his sanction to the marriage, which was publicly solemnized at Greenwich, on the 13th of May, 1515.

The return of Henry's favour was accompanied by a grant of the great estates which had formerly belonged to Edward de la Pole, Earl of Suffolk; while the fortune of the duke was yet more increased by the immense wealth of his bride. Her jointure was sixty thousand crowns annually, and the personal property which she was allowed to bring to England was estimated at two hundred thousand, together with a celebrated diamond of immense value, called 'The Mirror of Naples.'

In the festivities which distinguished the famous interview between Henry and Francis in Picardy, in 1520, the Duke of Suffolk was among the first of Henry's gallant companions, and rendered himself conspicuous in the jousts and tournaments for which the Field of the Cloth of Gold was so celebrated.

A circumstance, however, occurred in 1523, which, though it reflects more on the imperfect state of military economy in those days than on the character of the duke, had like to have lost him the king's favour. He had invaded France at the head of 12,000 men, aided by

8000 Germans, and the utmost efforts of the French were insufficient to prevent this small force from penetrating within eleven leagues of Paris. Yet, having gained this immense advantage, he found himself obliged to retrace his steps precipitately to Calais, to save his men from dying of hunger. Henry was highly displeased at this retreat, and the duke wisely deferred his voyage to England till he had appeased his master's choler.

In 1536 he commanded the troops which were then hastily raised to march against the insurgents of Lincolnshire and Yorkshire; and in 1544 once more attended Henry to France, and was appointed general of the army sent to besiege Boulogne, which he reduced after a siege of six weeks. His health was probably at that time declining, for he made his will immediately before his departure, and died on the 14th of August in the following year. He was interred with great magnificence by the special command of the king, though in opposition to his own expressed wishes, at St. George's Chapel, Windsor.

Though the Duke of Suffolk was not without talents as a commander, his fame as a soldier will principally rest on his bravery and gallantry in action; while he will be better remembered as the first and favourite courtier of Henry's gay court,—as the politest nobleman of his time. The protegé of a king, educated at court, and from his earliest youth the companion of a prince distinguished for his gallantry above all others of his time, Charles Brandon acquired all those graces and accomplishments which qualified him to move with so much applause in the high station he filled, and which rendered him the life and soul of all the amusements of the court. If a "gentle passage of arms" called together the noble and the brave, the Duke of Suffolk shone pre-eminent among the chivalry of neighbouring states, and brightened even the lustrous ranks of his own countrymen. If a ball was given in the palace, or a grand fête held on some joyous occasion, or a masque contrived for the amusement of the queen and the ladies of the court, the aid of Charles Brandon was always required; and no entertainment was considered complete if his co-operation was not obtained. If his biography presents us with none of those brilliant events which the historian loves to dwell upon, it is gratifying to reflect that no passage of his life calls for that censure which we are but too often obliged to apply to those characters whom history dignifies with the title of "great." No one ever made fewer enemies; none ever died regretted by more friends, or was more universally respected and admired, than Charles Brandon, Duke of Suffolk.

The armour in the Tower of this nobleman's, is a suit of plate, of the date of 1520, and is identified as having been worn by him.

Of a kindred disposition to this nobleman, though perhaps gifted with more penetration and discernment, was Edward Clinton, Earl of Lincoln, who, surviving the gaiety which prevailed in Henry's court, and being of an active temperament, launched more into public life, and became of some note not only as a warrior, but as a politician and diplomatist.

He was the only son of Thomas, eighth Lord Clinton, by whose death, in 1517, Edward Clinton, at the age of five years, fell in wardship to the crown. Educated in the court, his youth was passed in all those magnificent and romantic amusements which distinguished the commencement of Henry's reign; nor was it till 1544 that he appeared in any public character. In that year he attended the Earl of Hertford, and Dudley, Lord Lisle, afterwards Duke of Northumberland, in their expedition to Scotland; and it is said, that in consequence of his intimacy with the latter nobleman, who commanded the English fleet, he determined to engage in the naval service. He was knighted at Leith by the Earl of Hertford, who commanded in chief, and then embarked with the admiral for Boulogne, where he arrived in time to assist the king in the siege of that town. In the following year he lost his friend the Duke of Suffolk; and the king dying the year after, he attached himself to Edward VI., to whose favour public services were a greater recommendation than the politeness and gallantry by which the courtiers of Henry VIII. obtained advancement.

The fleet which aided the Protector's great irruption into Scotland was confided to his charge, and owing to a singular circumstance, he is said to have had a considerable share in the victory of Musselburgh without quitting his ships; for the van of the English army having changed its position, the Scots, imagining it was flying to the fleet, forsook the high ground on which they had been advantageously posted, and, following the English to the shore, were received with a furious discharge of cannon, which threw them into irrecoverable confusion.

Soon after this period, Lord Clinton was constituted governor of Boulogne; and on his return from thence, after the peace of 1550, he was appointed of the king's privy chamber, lord-admiral of England for life, and a knight of the garter. To these distinctions were added grants of estates to a very considerable amount. In 1551 he was employed in some negotiations with France, in which he was successful. Edward VI. died soon after, and Lord Clinton, having recommended himself to the favour of that prince's successor by his early expression of attachment to her title to the crown, was sent in 1554, together with others of the loyal nobility, at the head of a military force against Sir Thomas Wyatt. In 1558 he was confirmed in his post of lord-admiral, and appointed commander-in-chief, both by sea and land, of the forces then sent against France and Scotland. On the death of Mary, he obtained the favour of Elizabeth, who continued him in the post of admiral, and chose him of her privy council. He was appointed a commissioner to examine Murray's charges against the Queen of Scots, and joined to Dudley, Earl of Warwick, in the command of the army sent in 1569 against the rebellious earls of Northumberland and Westmoreland. On the 4th of May, 1572, he was advanced to the dignity of Earl of Lincoln, and was immediately after despatched to Paris, with a splendid train of nobility and gentry, to attend the ratification of the treaty of Blois by Charles IX.

After this period he was very little employed in public affairs, though he still enjoyed the favour of his sovereign, awarded perhaps more to his probity and fidelity than to his talents, which were adapted more to warlike manœuvres than to the intrigues and duplicity with which the ministers of Elizabeth were required to make themselves acquainted.

The Earl of Lincoln died on the 19th of January, 1584, and was buried in St. George's Chapel, Windsor, where a superb monument of alabaster and porphyry marks his tomb.

The armour of this nobleman in the Tower is very richly gilt, and is supposed to be of about the date of 1535. He wears a long fluted sword, and carries a mace in his right hand.

Management.—Without method time is nearly valueless—it is wasted in unprofitable occupations, or frittered away in unconscious idleness. The old adage of—'Take care of the pence, and the pounds will take care of themselves,'—may be well applied to the employment of time: 'Take care of the minutes, and the hours will take care of themselves.' Many an idle minute might be so filled up in a family as to save hours of future labour. Where it is of consequence to economise time, there order should more peculiarly reign.

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NICE.

[Nice, from the Heights on the road to Villefranche.]

NICE is beautifully situated in a small plain, which it almost covers, at the foot of the Maritime Alps, that almost seem to shut it out from the country to which it geographically belongs—Italy. The waters of the Mediterranean wash its walls on the south, on the north and the east the mountains enclose it round in the form of an amphitheatre, and on the west it is bounded by the Paglion, a mountain-stream which, being fed chiefly by the melting of the snow on the mountains, is frequently deep and rapid in winter, whilst in summer it is often quite dry. A steep rock overlooks the town, on which stands the ruins of the citadel of Mont Albano, deemed at one period impregnable, but which was taken and dismantled by Marshal Catinat in the time of Victor Amadeus, and which was finally demolished by the Duke of Berwick, after a close siege during the reign of Queen Anne. Nice is built in the form of an irregular triangle, the base of which fronts the sea. It is divided into two parts, known respectively as the old and new town. Both are built of stone, but the streets of the former are narrow and mean looking compared with those of the latter, in which the houses look handsome, being more modern and painted externally in fresco. There are two noble squares, one of them surrounded with porticoes. Adjacent to the other is a raised terrace which serves as a defence for the town against the sea, and affords a delightful promenade. On this terrace there is a miserably designed and executed statue of Catherine Seguiran, a heroine who assisted in the defence of Nice against the Turks. The ramparts of the town on the land side also form a pleasant public walk. There were formerly several suburbs, but the only one now worth mentioning is that of La Croix de Marbre (the Marble Cross), not unfrequently known by the name of the English quarter, from the number of our countrymen who are generally to be found resident there during the proper season. This is divided from the town by the Paglion, over which is a bridge of three arches, forming the entrance to Nice from the Provence side. This suburb has a beautiful appearance, the houses not only being painted in fresco, but being also surrounded with gardens, in which orange and lemon trees stand conspicuous. Of the beauty of the small plain on which the city stands, Smollett, who resided here for some time in the last century, speaks with enthusiasm. "When I stand upon the rampart and look around me, I can scarce help thinking myself enchanted. The small extent of country which I see is all cultivated like a garden. Indeed the plain presents nothing but gardens full of green trees loaded with oranges, lemons, citrons, and bergamots, which make a delightful appearance. If you examine them more closely, you will find plantations of green peas ready to gather; all sorts of sallading and pot herbs in perfection, and plats of roses, carnations, ranunculas, anemonies, and daffodils, blowing in full glory, with such beauty, vigour, and perfume as no flowers in England ever exhibited." This passage was written in and refers to the appearances of vegetation in the month of January. The chief public building is the cathedral, or church of

Santo Reparata; among the others may be mentioned the Theatre, Hospital, Public Library, Baths, &c. The library is tolerably large, and contains some manuscripts. There are many inns and cafés, &c. Provisions, with the exception of game, are plentiful and cheap. The wine and oil of Nice are pre-eminently good. Water is obtained chiefly from the wells, which is very hard, but not unwholesome. In the neighbourhood there are some fine springs. Nice possesses some silk, cotton, and paper-mills; many oil-mills, and a tobacco manufactory. Soap, liqueurs, essences, and perfumery are also made. The port, which is protected by a mole, is spacious and secure; vessels of 300 tons can enter it. The principal trade is in silk, oranges and other fruit, and in the manufactures of the town. The roadstead would afford anchorage for a hundred ships of the line. Nice is a bishop's see.

The climate of Nice has been much praised for its mildness and general beauty. But the neighbourhood of the Alps, and the occasional prevalence of the Vent de Bise, a keen searching wind, render the atmosphere sometimes cold and frosty in winter and spring; whilst in summer the heat is excessive. Nice is much resorted to by invalids from our own and other countries, and this influx of strangers greatly augments the population, which now, it is supposed, amounts to about 80,000.

Nice was founded by the Greeks of Massilia, or Marseille, and fortified by them to repress the hostile movements of the neighbouring tribes, and in order to secure the navigation of the adjacent sea. It continued subject to the Massilians after the establishment of the river Var, or Varus, as the boundary of Gaul and Italy, which runs at a distance of about ten miles from Nice. Ultimately the town was subdued by the Romans, and afterwards fell successively under the dominion of the Goths, Burgundians, and Franks, the kings of Arles, and the kings of Naples, as counts of Provence. In 1383 the city and county voluntarily surrendered themselves to Amadeus, surnamed the Red, duke of Savoy; in the possession of whose successors, now kings of Sardinia, they have ever since remained, except at such periods as they have been overrun and taken possession of by France. On the last occasion of the kind, in 1791, Nice was annexed to the French Republic, and made the capital of the department of Alpes Maritimes, and it was not until the general arrangement of territories consequent on the peace of 1815 that it returned to the Sardinian dominion.

The walks and rides in the neighbourhood are very agreeable. The white stuccoed houses, surrounded with gardens, on the slopes of the neighbouring hills, have a highly picturesque appearance. About two short miles from the town, on the summit of a lofty hill, are the ruins of the ancient city of Cemenelium, now the hamlet of Cimiez. This was once the metropolis of the Maritime Alps and the seat of a Roman president. The ruins consist of parts of an amphitheatre, a temple, baths, an aqueduct, &c. The amphitheatre was of an oval form. The temple is supposed to have been dedicated to Apollo; in it several mutilated statues have been dug up. The aqueduct was scooped through a mountain, and appears to have been a grand work. The water is exquisitely cool, light, and pure; it now serves to turn some of the mills of Nice. Great numbers of coins and medals have been found here, and the whole spot is doubtless a rich mine of antiquities.

ON THE ALBINO.

The common integument or skin of the human body is a much more complicated structure than it appears at first sight. Without going into the details which an anatomical description would require, we may observe that it consists of three separate strata or layers, which however are yet closely joined to each other:—1. The outermost layer, termed the *cuticle* or *scarf skin*, is a transparent and insensible membrane, being merely for the protection of the more sensible parts beneath, and the medium of their communication with external objects. Naturally very thin, and hence nowise preventive of the delicacy of sensation, it may become, by the irritation produced by continued attrition, very indurated and thickened, as is seen in the hands of the labouring classes, when of course the susceptibility to impression of the parts which it covers is much diminished. In the hands of smiths, or on the soles of the feet of those who traverse the deserts, it often becomes of quite a horny consistence, thus offering to these parts a most useful protection. But should the skin be too severely or too suddenly excited, the cuticle, instead of being thickened, is raised up from the skin by the effusion of fluid, and may be even thrown off from it, leaving the irritable skin exposed: all this is seen as the result of the application of a blister, scalding water, &c. Thus, too, according to the degree in which the toe or heel may be pressed upon and irritated by the hard unyielding leather of new or tight shoes, a small blister, or a corn, which consists of a small mass of hardened cuticle pressing into the tender skin, may be produced. 2. The innermost stratum, or *true skin*, is a dense, compact, smooth structure, freely supplied with blood-vessels, whence the flush of fever or of agitation; and with nerves, whence the acute sensibility of the skin to pain, and its adaptation as one of the organs of sense. This part in itself is as colourless as the cuticle, but it will be of a more or less red or pale colour according to the activity of the circulation of blood in it. 3. The intermediate stratum is called the *mucous* layer. It is soft in texture and is considered as the seat of colour in the various coloured races of mankind; and thus, thick and distinct in the negro, less so in the copper-coloured Indian, scarcely existing in the fair inhabitants of Europe, it is absolutely absent in the white variety of man termed the Albino, in whom the white or reddish white colour of the true skin shines through the transparent cuticle.

As the darker races of mankind usually inhabit the warmer portions of the earth, this difference of colour has been very generally attributed to the influence of the sun's rays. But several acute modern observers have shown that this opinion is the result of a too hasty generalisation, and inconsistent with several well known facts. It is not our object now to dwell upon this subject, but we may allude to one or two of the observations that have been made. Thus, if the sun's rays be the cause of the jet black colour of the negro, the parts of the body habitually clothed should at least be less influenced than those continually exposed to them; but such is not found to be the case. Again, let the white variety of man inhabit, even for centuries, the same sultry regions, and yet we never find, providing he does not intermarry with the negro race, that he ever acquires their peculiar colour; the utmost he acquires is a degree of browning or tanning from the sun, which is confined to the individual, and is never, as with the black colour, conveyed to his descendants; on the other hand, the natives of Africa have been transported to every variety of clime, have often adopted new and entirely different modes of life, yet have they not even in the slightest degree changed in colour. A moment's reflection as to the geographical distribution of mankind will also show us that this influence of climate has been misstated or exaggerated. To quote the words of an able writer upon this subject, "The Moors of Africa, and the Arabs of the desert, are born with a white skin, and continue fair unless adventitious causes are applied. But the Laplanders and Greenlanders, the Esquimaux, Samoides, &c., who hardly ever feel a moderate heat from the rays of the sun, are very dark. . . . These tribes owe their origin to the Mongols, and retain in the north those marks of their descent, which we find as strongly expressed in the Chinese, under the widely different latitudes of the south. At the same time the

parent tribes live in the middle of Asia, equally removed from the former and the latter." In fact the various races of mankind, the negro of Africa, the copper coloured Indian of America, the inhabitants of Asia or of Europe, are each spread through such differences of latitude, such varieties of soil and position, whether continent or island, mountain or valley, that almost every possible degree of heat and of cold is involved in each, and yet is not accompanied by corresponding changes of colour.

But to come to the immediate object of this paper, the Albino was so named by the Spanish and Portuguese from the extreme whiteness of his appearance. The whiteness of his skin is not of that description we usually understand by that term, it is rather a pallid or waxen whiteness, though in some examples this is also mixed with a reddish tinge. The hair is also of a milk white, or sometimes of a yellowish white, often of a silken consistence and luxuriant growth. This same colour, or rather absence of colour, pervades the hairs of the eyebrows, eyelashes, beard, and of a slight down which frequently covers the body. The iris (or coloured portion of the eye) is usually of a pale rose colour, though in some examples it is of a bluish-red cast, the pupil (or dark central portion of the eye) is intensely red—exactly resembling, in fact, the eye of the white rabbit. There is a constant twinkling movement of the eye, over which the eyelid is usually partially drawn, owing to the uneasiness felt upon the admission of too great a portion of light, for which reason also their powers of vision, feeble during the bright light of day, become stronger in the evening or in the shade. There is sometimes some debility of body present, and their mental capacities have been rated low, though, it would seem, upon insufficient evidence.

From the account we have given of the structure of the skin, it will at once be seen that its whiteness in the Albino results from the absence of colouring matter in that organ; and a similar deficiency accounts for the other peculiarities. Thus the hair, owing its colour to the presence of this same colouring principle, deprived of it becomes white, a colour which may also arise from the absence of the iron which is found in dark hair. The redness of the eye, as also its irritability to light, results from an analogous cause. This organ, in its natural state for the due performance of its functions, is most abundantly supplied with blood-vessels, forming a beautiful vascular network behind the pupil. These are concealed from our view by the deposition of a very black pigment which covers all the posterior parts of the eye, and which absorbs all the rays of light which enter the pupil beyond those necessary for the purposes of distinct vision. When this pigment is absent, the red colour of the blood, circulating in its transparent vessels, shines through the pupil and the iris, producing the redness of the eye of the Albino, while an excess of light is admitted to its delicate nervous structure.

The explanation of the *cause* of this absence of colouring matter in the Albino has given rise to numerous conjectures and speculations, some of them of a very fantastical and absurd character, which we have neither space nor inclination to examine. We may however allude to the theory proposed by M. Isidore Geoffroy St. Hilaire as the one nearest approaching to probability:—The result of modern investigations has led many anatomists to believe that the growth or development of the various parts of the human creature, prior to birth, takes place in regular and successive stages, at each of which stage the imperfectly formed being bears a very close resemblance to the perfect state of some one of the inferior classes of animals. Supposing some accident to arrest the development at one of these stages, an imperfect being would result, and this is one explanation of the production of monsters as they are called. Now as it is known that the colouring matter is not deposited in the infant's structure until a short period prior to birth, so St. Hilaire thinks its absence in the Albino arises from the development of the skin having from some cause been arrested prior to the period when this secretion into its structure ought to have taken place.

By Winterbottom, Blumenbach, and others, Albinism has been supposed to be the result of disease, a species of leprosy; but although the skin has often a scaly or scurfy appearance, and, from its delicate texture, is more liable to atmospheric and other influences, yet there is no reason whatever to believe this opinion well founded, as the Albino frequently manifests every sign of good health. In the words of Voltaire, to suppose that an Albino is a negro blanched by a leprosy, is about as reasonable as to suppose that a negro is a white blackened by disease.

The first examples in modern times were discovered in Africa, where their direct contrast to the ordinary colour of the natives would render them very remarkable. They would seem to have been always more abundant in that than in other quarters of the globe, and Mr. Bowdich informed Mr. Lawrence that the king of Ashantee had collected nearly a hundred white negroes as curiosities. Some have gone so far as to assert the existence of a separate nation or people, but without adducing any proof of it. Albinos, however, are by no means confined to Africa; Blumenbach himself has seen sixteen in Germany, while numerous examples have been observed in various other parts of Europe. Wafer and Dampier describe their occurrence as very frequent in the isthmus of Darien; but Humboldt states that, generally speaking, they are uncommon among the copper-coloured races of America. Cook records having frequently met with them in the isles of the Pacific. Dubois says they are not common among the Hindus; while we have no account of their existence among the Chinese and Mongols.

As the negroes are found too black to suit the taste of their fellow-men, so are the Albinos considered too white, and hence insulting epithets and cruel treatment have been too often their lot. Nay, their very right to the appellation of human beings has almost been denied them, and hence Voltaire has described them as animals resembling men, living in caverns and holes during the day, possessed of limited powers of mind and body, and serving to fill up the interval between the Hottentot and the monkey. Whether from their unusual colour, or from its being believed that they are mentally and bodily deficient, certain it is that they have been almost universally regarded with pity or contempt, and by none more so than by the negroes, whose dislike to the white colour in mankind may serve to explain their aversion to these marked examples of it.

Although the peculiarities of the Albino usually arise primarily in the individual possessing them, yet may they become sometimes hereditary, usually ceasing, however, at once, and always eventually, by intermarriage with the dark races. Of a white African woman the parents were both black, as were also her brothers and sisters; she married a black man, and had a black child.

Generally existing at birth, Albinism sometimes comes on by slow degrees after it, and then the change from black to white has been sometimes partial only. The examples of spotted children, occurring in the black or white races, arise in the one case from the too deficient, in the other from the too abundant, secretion of the colouring matter, such deviations being partial only in both cases.

Albinism is by no means uncommon in animals, but it is in them, unlike what usually takes place in the human creature, when produced, almost always hereditary. Numerous quadrupeds, both wild and tame, and almost every species of bird, have furnished examples, but the state has never been met with in cold-blooded animals.

In conclusion, we may notice a literary production of an Albino, contained in the library of the College of Surgeons. It is a treatise in Latin by an Albino named

Sachs, giving a minute account of the peculiarities characterising himself and his sister, also an Albino, in which he endeavours to show that several of these peculiarities have been exaggerated by writers, and that they exist in a greater degree among African than European Albinos. They were both born in the Carinthian Alps, in the latter end of the eighteenth century, of parents manifesting no peculiarities of health or colour. Prior to the birth of each of them, their mother had been alarmed by the glaring of an animal's eyes in the dusk of the evening. Between these two children, she had a son and daughter, in whom no trace of Albinism existed. The health of himself, as well as that of his sister, was good, and their constitutions robust. He describes their skin as not being of a dead-white cast, but as possessing a slight redness, especially if it were washed, &c., while it never became burned or freckled by the sun. Their hair was soft and flowing: there was no down on the surface of the body, and he was only obliged to shave twice a week. Although their eyes involuntarily closed on the afflux of too brilliant a light, yet were they not suffused with tears or sore, as in some Albinos, but they continued in oscillatory motion independently of the will. The redness of the eyes was always brighter when exposed to the sun's rays; while in the shade of evening, some degree of fulgor or glaring was observed, as in some animals.

Zoological Society of London.—The Annual Report of this Society, for the year 1839, has been just published. It is of course, to a great extent, of a financial character, and is, on the whole, satisfactory as to the general state and prospects of the Society. In 1839, it is said, the number of visitors to the Museum was 3716, and the money received for admission 31*l.* 3*s.* The total number of visitors to the Gardens was 158,432, and the admission on the usual orders produced 5004*l.* 3*s.*, being 635*l.* 14*s.* less than in 1838. But the Report states, "There is already a considerable balance (298*l.* 18*s.*) on the important item of Garden receipts, in favour of the current year (to April) as compared with the corresponding period of the past, which affords a proof that the deficits of the last two seasons are to be attributed to the continued prevalence of rainy and unfavourable weather, more especially during the summer and autumn of 1839, and that they were in no degree owing to any deficiency of attractiveness on the part of the Society, or to decreased interest on that of the public. The whole number of animals contained in the menagerie on the 1st of April, 1840, amounted to 910, of which 303 were mammals, 587 birds, and 20 reptiles. The menagerie has also been enriched during the past year by an unusual accession of new and rare animals, of which no fewer than 7 mammals were new species, and 22 mammals and 21 birds had never before been exhibited in the Gardens." One of the most interesting passages of the Report, however, is perhaps that relating to the introduction of new useful domestic animals. We give the passage in the words of the Report:—"The committee of auditors, in noticing the sum of 224*l.* 2*s.* accredited to the account of Garden sales during the past year, and which was principally the produce of the sale of animals bred and reared at the Gardens, express a hope 'that this success, limited as it may seem, will serve as an encouragement to prosecute with renewed exertions this interesting object of the Society.' The introduction and propagation of new and rare species, especially such as are likely to prove valuable accessions to our stock of domestic animals, is unquestionably one of the most legitimate objects of the Society, and the council will spare no trouble to accomplish so desirable an end; but whatever interest may attach to the experiment in a scientific or economical point of view, it may reasonably be doubted whether this department can ever become a source of pecuniary emolument to the Society, or repay the expenses necessarily incurred in supporting it. Still the council will not relax in their efforts to fulfil the rational hope expressed by the committee of auditors, on a subject of so much interest to the Society at large, and which may possibly prove to be of national utility. The increased accommodation which has been provided for the breeding of the ornamental species of water-fowl has been already noticed; and the attention of the council is now directed to the propagation of the guans and curassows, those gallinaceous birds which supply the place of the pheasants and peacocks in the forests of South America, and which, from their size and beauty, and the superior delicacy of their flesh, are likely, at no distant period, to form a valuable accession to our poultry and farm-yards. Hitherto, the limited accommodation which the Gardens supply for this purpose has in a great measure defeated their expectations; but arrangements have been lately made with a distinguished member of the new council, for sending a few pairs of the Society's extra stock to the country, where they will have the advantage of enlarged and superior accommodation, and it is hoped that the experiment will not disappoint the reasonable expectations of the council."

Food of the Sandwich Islanders.—These islanders subsist almost entirely upon taro roots, sweet potatoes, and fish. Taro is their chief dependence — it is to them as the bread-fruit to the Tahitians, and its cultivation is their most important agricultural employment. They eat it in the form of a paste or poë, which they prefer when it is in a fermented and acid state. The vast quantity of this food which an ordinary native, but more especially a chief, will devour at one meal is a subject of perfect astonishment to the European. When intended to be kept for some length of time, the baked taro-roots are pounded into a dry and compact mass, which is enveloped in leaves, and named by the natives *ai paa*, or hard food. Yams, bananas, and bread-fruit are very rarely consumed by the generality of natives. The first-named vegetable is chiefly grown for the supply of shipping, and the two last are far from being abundant. Swine and fowls are also much less numerous here than at the Society Islands, and are mostly reared for traffic with foreign vessels. As adjuncts to their vegetable food, the poorer natives collect wild herbs from the pasture-lands, chiefly a kind of wood-sorrel, or a species of Euphorbia, and even an *ulva* which forms "the green mantle of the standing pool;" while crowds of the same people may be seen swimming and diving outside the great reef at Honoruru, to obtain shell-fish, crabs, sea-weed, and other marine esculents, which they deposit in floating calabashes, and convey to the shore for their day's meals. There is no animal food which a Sandwich Islander esteems so much as fish: whether recent, salted, or even in a state of putrefaction, it always proves acceptable to some class of the population. Many canoes are employed day and night in fishing off the shores of Oahu, yet the supply of fish is not equal to the demand, and large quantities (often including sharks and other coarse kinds), dried or salted, are imported into Honoruru from the neighbouring islands. The chiefs, whose diet is less restricted, keep live fish in tanks or reservoirs of sea-water dug in the vicinity of the coast, and have some of the smaller kinds, taken in the bays, conveyed alive to the interior of the island in calabashes of sea-water. The *fe*, or cuttle-fish, is considered a luxury by all classes: when fresh and well cooked it is certainly an excellent food, and in consistence and flavour is not unlike the flesh of a lobster's claw. A palatable native dish is prepared by stewing in an oven an assemblage of fowls and other meat, young taro-leaves, and sweet potatoes, the whole contained in a calabash. Thus cooked, the taro-leaves afford a wholesome and agreeable food. The entire dish is called *luau*, a name which is also applied by the foreign residents to any public or jovial feast. Since the preparation of taro-poë is a tedious task, and many of the natives in Honoruru are transient visitors, or actively occupied as servants to foreigners, a market is established in the town, where that popular food can be purchased in a state fit for immediate consumption. A hut, called by foreigners the "native hotel," has also been opened as an eating-house for the same class of people; and here it is not uncommon to see a skinned dog suspended invitingly at the door, to denote what dainties may be had within, in the same manner as a turtle or a haunch of venison is occasionally exhibited at *restaurateur* establishments in London. From the roasted and saccharine root of the *ti* shrub, the islanders distil a spirituous liquor called *kava*, and which is similar to the *ava* prepared from the bread-fruit at the Society Islands. Though no restriction is placed upon its preparation or use, and some of the natives will indulge immoderately in this, as well as in foreign spirits, drunkenness is not a popular vice.—*Bennet's Narrative of a Whaling Voyage.*

BURGHLEY HOUSE, NORTHAMPTONSHIRE.

[North Front of Burghley House.]

Burghley or Burleigh House, the seat of the Marquis of Exeter, is situated in the centre of a noble park, at the distance of about a mile and a half from Stamford. It was built by Cecil, queen Elizabeth's famous minister, who, however, it is said, made use of an ancient structure existing at the time. The east and north ends of the present building, and the stately hall used as the kitchen, are supposed to be parts of this original structure. According to Horace Walpole, the architect of Burghley House was John Thorp; and it appears to have been commenced about 1575.

After crossing Stamford bridge, which divides the counties of Lincoln and Northampton, and proceeding up the London road for about half a mile, we perceive to the left an elegant modern lodge of three arches, having a building on each side, surmounted by a cupola, in which the gatekeepers reside. From hence the approach to the house passes by a winding road through a wide avenue of lofty trees, and then through the park, which is studded every here and there with clumps of trees, plantations, and shady avenues. After a walk of about a mile on this road, the house becomes visible at the end of a green vista, which it completely fills up. Presently we have the magnificent north front directly before us. The house forms a quadrangle of immense size, surrounding a court; from its top rise a great number of towers, cupolas, and chimneys in the form of antique pillars, and the tall spire of the chapel. The breadth of the windows is remarkable. Altogether Burghley presents perhaps the most important mansion our country possesses in the Elizabethan style of architecture. On application to inspect the house, strangers are conducted across the court-yard, and after ascending a staircase, are introduced to the great hall, which measures 68 feet in length and 30 in breadth, and is very lofty. It is lighted by two windows, and has an arched oak roof carved in the richest manner. There is here a statue of Andromeda chained to a rock, and various other sculptures, some paintings, a fine collection of stuffed birds (British), and a remarkable chimney-piece of immense size, which was found in a house at Richmond, and presented by its owner George Selwyn, Esq., to the noble descendants of Lord Burleigh, on account of its bearing the arms of that distinguished statesman. From the hall we pass through a saloon into the corridor, a recent addition to the house, having been built only about fourteen years since. It runs round the entire inner square of the edifice, and is elegantly designed. A winding staircase conducts us to the chapel, which is divided by three splendid arches into two parts, the one for the use of the family, the other for the servants, &c. This, as well as every other part of the building, abounds with paintings and sculpture; the former alone are said to be about five hundred and fifty in number. We shall therefore only notice those which have some particular claim upon the attention; and as criticism on works of art carries little weight with it when confined to such brief remarks as our space alone admits of, unless something be known of the critic, we shall avail ourselves of Dr. Waagen's assistance, who, in his well known work,* has some notices of Burghley. To avoid the necessity of continual reference, it may be mentioned once for all, that the opinions expressed in the following account of the artistical treasures of the mansion are (generally) his. The altar-piece in the chapel represents the mother of the sons of Zebedee requesting Christ to permit her sons to sit in heaven, one on his right hand, the other on his left. The figures are whole-lengths, of the size of life. The painting is not in a favourable light, and seems to be one of the inferior works of the artist, Paul Veronese. There is also in the chapel some carved wood festoon-work, by the famous Gibbons. From the chapel we pass to the billiard-room, which contains many pictures, and one in particular by Sir Thomas Lawrence, to which some interesting associations are attached—we allude to the portrait of Sarah, second wife of Henry, the tenth earl and first marquis of Exeter. The beauty of the face and form, the grace and feminine dignity displayed in this portrait, seem to account for the extraordinary step which raised her from one of the humblest to one of the most exalted stations of life. The story is told somewhat in the following manner:—

* 'Art and Artists in England,' by G. F. Waagen, director of the Royal Gallery of Berlin, vol iii., p. 271.

Henry Cecil, nephew of the ninth earl, formed an unhappy marriage in his youth, and which was finally dissolved by a divorce. His uncle, it is said, then advised him to retire for some time into privacy; and he accordingly withdrew into a distant part of the country, and took up his residence in a small village. The farmer with whom he lodged had a daughter, into whose society Cecil was naturally thrown. He admired, loved, and ultimately paid his addresses to her. He was accepted, and masters immediately engaged to give her the best possible education. They were married, and it was not till the death of the uncle, when it became necessary for the new earl to appear in his own proper character, that the truth was disclosed. Our readers may imagine better than we can describe the astonishment of a simple country girl, whose wishes and thoughts perhaps had scarcely ever wandered beyond her native village, at finding herself thus suddenly become a companion for the proudest in the land, the mistress of a magnificent—almost a regal—domain, and attended by countless domestics anticipating her every wish.

From the billiard-room we next proceed to the ball-room, which is lighted by a bow window of great size. The walls and ceiling are painted with subjects chiefly from Roman history, by Louis La Guerre, a Frenchman, and an assistant of Antonio Verrio. By this last-mentioned artist, an irregular descendant of the irregular Neapolitan school, several of the finest apartments (walls and ceilings) were peopled with repulsive figures about the middle of the seventeenth century. He spent, remarks M. Waagen, twelve years in completing these masterpieces of bad taste, during which period he received from Lord Exeter, besides table and equipage, 1500*l.* per annum, that is, in all, far more than Raphael or Michael Angelo ever received for all the immortal wonders of their genius. In a room called the brown drawing-room, among other paintings are the following portraits:—King Henry VIII., a half-length, holding a label with the words from the Bible, in Latin—"Go forth into all the world, and preach the gospel to every creature." It is very carefully painted by Holbein in a brownish tone. King Edward VI., at the age of seven or eight years, is by the same artist. The head and the hands are painted in a peculiarly reddish local tone of the flesh and grey shadows. The portrait of Lady Dorothy Nevill, the first wife of Thomas, the first earl of Exeter, is in refinement and delicacy of conception, tone, and execution, one of the most beautiful pictures of Cornelius Jansen. Here also is a picture by Jan van Eyck, the Virgin with the infant Christ in her arms, and St. Barbara, who presents an ecclesiastic in white robes, kneeling. The background, landscape, and architecture in this small picture, remarks Waagen, bear so strongly in every part the stamp of the master, that I recognised it as his at the first sight, and was very glad when I heard that it was properly named. It is a highly finished miniature in oil; and in the tone and treatment has the greatest resemblance to the masterly picture of Jan van Eyck in the Louvre. There is in this room some more of Gibbons's extraordinary wood-carving, in fruit, flowers, birds, &c.; the feathery appearance of the wings of the latter is given with admirable fidelity. We are next ushered into the black or black and yellow bed-chamber, so called on account of the colour of the trimmings, and which contains in particular three pictures painted on panes of the window. From this room we enter the dressing-room, containing, among other admirable works of art, a portrait of Lady Pembroke, after Vandyck, by Edmund Ashfield, who flourished in 1680, and which is remarkable for its delicate finishing; and a portrait of Robert Devereux, earl of Essex, Elizabeth's celebrated favourite, the very model of a favoured courtier. Handsome, delicate, but by no means expressive features; an air of superiority, the expression of excessive arrogance and extreme self-conceit, which fancies itself absolutely irresistible, make this portrait very characteristic. The dress is extremely fine and studied. It is by Marcus Gerards, a second-rate painter of Bruges, who was much employed by the English court after the year 1580. On the right of this dressing-room we find another extremely rich in pictures. A singular production in the window arrests attention—a painting of a blacksmith's forge on a pane of glass, executed by Margaret Pearson, in 1789. A small ante-room, called the china closet, contains a remarkable production—'The Last Supper,' carved on wood, in alto-relievo, by Gibbons; also some curiosities and pictures. Turning now out of the straight line, and proceeding for some distance, we are conducted into Queen Elizabeth's bed-room, where we find the very bed, still hung with the same hangings of green and gold brocade, that was occupied by Elizabeth on her visit to Burghley. This room is ornamented with rich tapestry, and contains various paintings. The next room shown to us is called Queen Elizabeth's dressing-room, which is situated in the centre of the west end of the building. It contains some fine pictures; one is by Ruysdael—a Waterfall, powerful and fresh in the colouring, and careful in the execution. Another picture is ascribed to him, but it hangs in too bad a light to enable one to give an opinion of it, and appears to be doubtful. A portrait of Luther, by Lucas Cranach, is a genuine but unhappily a ruined picture. There are also various other portraits of distinguished characters. The next room is the purple velvet bed-room, hung with tapestry exhibiting bacchanalian subjects. Of the pictures it contains we must mention that by Michael Angelo da Caravaggio. The subject is 'Susannah and the Elders.' In colouring and painting it displays all his peculiar force, and is more discreetly conceived than might be expected of him. In the blue dressing-room, so called from the rich blue damask hangings, is shown a picture, said to be by Raphael, but which, M. Waagen observes, is an old copy of the picture called the 'Belle Vierge,' in the Bridgewater gallery, but with still less pretensions to originality than that. This room is particularly rich in works of art, but we can only notice a few of them. 'The Adoration of the Shepherds,' at Burghley, erroneously attributed to a painter of the name of Apollonius, is (M. Waagen says) by Giacopo Bassano, and is a remarkably good work. 'The Virgin and Child,' by Benedetto Castiglione, is far more noble and delicate than most of the pictures of this master. It was presented to the earl of Exeter by Pope Clement XIV. (Ganganelli). 'Susannah and the Elders,' by Sir Peter Lely, continues M. Waagen, is the best of all his historical pictures I have seen. The heads are in the *natural* style, but not vulgar; the execution spirited and careful, in a warm clear tone. In the picture, by Pœlemburg, of 'Christ with his two Disciples on the way to Emmaus,' the usual delicacy of execution is here united with uncommon force. To these we may add that there is a portrait of Tell, by Rembrandt, with very warm colouring, and a picture of a shepherd with his dog and flock, by Teniers, touched lightly in his bright tone. In the same room are some curious mosaic compositions; one of them representing the amphitheatre at Rome, and another a temple at Tivoli. We now proceed to the first of a very splendid suite of rooms stretching along the south front, known by the appellation of the George rooms. They were fitted up in the magnificent manner in which we now see them, on the occasion of an expected visit from George IV., then Prince of Wales. The state dressing-room, or first George room, has a painted ceiling by Verrio; the flooring is of oak inlaid with squares of walnut-tree; the walls are wainscoted in panels with the finest Dutch wainscot of its own natural colour, and enriched with carving. There are three among the numerous pictures of this room that we must notice. 'The Annunciation,' by Dionysius Calvart, is painted in a very

warm tone, and fused like an enamel, with the artist's name. A boy with a pigeon, by Guido Reni, is very pleasing, owing to its greater truth to nature than usual, and its clear colouring. Nicholas Poussin has here a carefully executed and nobly composed picture—the subject, 'Angels with the instruments of the Passion appearing to the infant Christ in his sleep.' At one corner of this room we find the jewel-closet, in which the celebrated picture by Carlo Dolce is exhibited, of 'Christ blessing the Bread.' The closet contains also a glass case enclosing various curiosities.

[To be continued.]

THE NORTH AMERICAN ELK.

[From a Correspondent.]

There probably is not a wild animal connected with the Western Continent (save the Mammoth, which is purely the creature of tradition, or rather of conjecture) concerning which more marvellous and absurd relations have been recorded, than the Elk, or Moose-deer. When the country was an entire wilderness, and the natural history of it but little known, the earliest explorers of the American forests frequently represented their falling in with strange animals somewhat resembling deer, but of a size far surpassing anything that had ever been discovered elsewhere. The 'Pilgrim Fathers,' as the first colonists in the New England States called themselves, or rather have since been so called by their descendants, among the wonders and dangers they encountered, represented their meeting with "enormous creatures, some of them as large as four of our full-grown oxen, with antlers on their heads of extraordinary dimensions." It is not at all surprising that the wild and unknown inhabitants of the vast forests should have been viewed by the first settlers through a somewhat magnifying medium, for all must have been strange and wild to them on their first landing; but when we find those marvellous accounts continuing to be repeated, and apparently credited too, long after the earliest emigrants must have become (one would imagine) tolerably familiar with these very creatures (for they were then common to almost every part of New England), the matter is not so easily accounted for; since it seems quite evident from the somewhat vague account of the monsters they occasionally encountered, that they must have alluded to the elk, and no other animal, which at that period was common to all the country that at present constitutes the eastern and northern states of the North American Union, as well as our own colonies in the same part of the world. What rendered these reports the more extraordinary was, that when America was first discovered, the elk had long been known as an inhabitant of the northern parts of the eastern hemisphere, so that the American elk was not a new species of animal.

When the continent of North America became farther explored, and when a better acquaintance with the wild inhabitants of the forests had taken place, it was ascertained that no such huge creatures, as had been early spoken of, anywhere existed upon that continent; the buffalo (a species of wild ox) and the elk being by far the largest animals found there. In America, as upon the old continent, the elk is found only in the colder regions; or, more correctly speaking, in those places where the winters are long and severe, for it was formerly an inhabitant of that part of the country through which collateral branches of the Alleghany Mountains run—even to the southward of the fortieth degree of latitude, where the winters are long and cold, but where the summers are often hot.

The common elk of America (*Cervus Alces*) is there frequently called the moose-deer, and by the Indians wampoose or wampoosa. The horns are wide-spreading and palmating, and very thick and strong towards the base, of a great weight in proportion to the size of the head, which, however, is of considerable length in proportion to the neck,—the nose, which is black, projecting forward. The ears are large and erect; and altogether the countenance is forbidding. Below each eye (which is large) there is a slit of nearly an inch in length through which it is believed to produce that peculiar whistling noise that it is known to make when alarmed, and occasionally during the rutting season; but it is generally considered to be uttered as a signal of danger rather than as a cry of fear. The neck is very short and thick in proportion to the legs, which are long, and in the male is crested with an upright mane six inches long; it has also a beard under its chin and throat. From the shortness of its neck and length of its limbs, the elk seems to pasture with some difficulty where the surface of the ground is even, and hence it more commonly frequents the banks of rivers and lakes, and districts where the country is rather broken and hilly. The fur, if so the covering of the skin may be called, is coarse, long, and hairy, and on the approach of winter becomes very thick; but varies somewhat in colour with the age of the animal, from a blackish brown inclining to a grey, to a lighter grey or pale dun. The tail, as in most of the deer kind, is very short, white below, and the rump to which it is attached of a tawny colour. Taken as a whole, there are few animals that exhibit a contour of less gracefulness and pleasing proportions than the elk. The females are destitute of horns, and much smaller than the males, which shed their horns early in spring. A full grown male elk stands nearly six feet high; and several have been killed in the British North American colonies that weighed, as they stood, from five to seven hundredweight. The female usually produces two young ones at a birth, generally about the latter part of April.

When the elk is aroused from his lair in the forest by the hunter or his dogs, it sometimes will suddenly fall down as if in a fit, apparently losing the use of its limbs; but in a very few seconds it will recover itself, jump up, and set off at a great speed. The Indian hunters hunt it both for the sake of the flesh and the skin; and near our Fur Company's stations in the north-west, Indian hunters are hired by the fur-traders to hunt for elk, as well as other animals, at so much per head, the reward amounting to a mere trifle in real value. An active Indian hunter will often set out in pursuit of his game without either gun or bow and arrows; and falling in with a full grown elk, will never give up the pursuit until he has fairly run it down. Although at first they run with considerable speed, a veteran hunter will often tire them in six or eight hours, they being somewhat tender-footed and short-winded. On finding themselves unable to maintain the contest longer, they will turn at bay and act on the defensive; but the Indian, by attaching his hunting-knife to the end of a long stick, stabs the animal in some vital part, and thus completes the capture. It occasionally happens that the chase will continue for a couple of days, and though the savage hunter but seldom views his game during the long pursuit, his extraordinary sagacity enables him to keep upon the track with the unerring steadiness of the blood-hound. When severely wounded, or irritated by dogs, there is danger to be apprehended in approaching the elk too closely; for so powerful is its blow, that with one of its fore-feet it will lay a wolf or large dog dead in an instant. In the rutting season it is the most dangerous to approach, for then it will, if closely pursued, not only attack dogs but hunters too.

Many attempts have been made in America to domesticate these animals, and thereby make them more subservient to man; but though attempts to break them in to harness have been made, the efforts seem never to have been attended with any degree of success. The American deer, when taken young, are easily tamed, and become as domestic and attached to their homes as pet-lambs or goats; nor do they often return to their native forests, when left uncontrolled and at perfect liberty to do so.

Formerly elk were found to the very shores of the Atlantic and as far south as the southern boundary of Pennsylvania, and westward across the entire continent, for they inhabit the district of country situated between the Rocky Mountains and the Pacific Ocean. But being naturally shy and solitary animals, as the country became inhabited (although in many places but scantily), they are now no longer met with, except far into the interior, or in situations where extensive bodies of woods still remain in their primitive state, without being disturbed by the sounding axe of the woodman. In New Brunswick, Lower Canada, and the adjoining states of Maine and Vermont, the moose-deer, as they are there called, are still to be met with; but when these countries become more generally settled with the human race, not an elk will be found remaining. They are commonly hunted when the snow lies deep on the ground and is not frozen sufficiently hard to bear them, when they are presently overtaken and become an easy prey. In the unsettled parts of Upper Canada they once were pretty numerous, and still are so in the regions of Huron and Superior and the lakes that lie farther to the north-west. The elk is somewhat migratory, moving to a considerable distance on the approach of winter from its summer haunts; and notwithstanding ten or a dozen of them may frequently be seen herding together, it is by no means properly a gregarious animal. In the more dreary and desolate regions towards the Arctic Circle more than a couple of them are seldom seen together.

In the late overland expeditions in quest of a north-west passage, Sir John Franklin states that several elk were seen feeding in the high latitude of 69°, near the Mackenzie River: they were browsing upon a species of willow near the margin of the stream. The flesh is not considered equal to that of the deer of the same country, and many conceive it to bear a resemblance to beef; but in seasons of scarcity the natives, as well as the traders at the remote settlements, are delighted when their good fortune happens to throw a fine fat elk in their way, the flesh of which they relish highly, and denominate it elk-meat or sometimes elk-venison. The Indians do not consider the fur of much value, but the skins, when dressed in their peculiar way, are used for clothing, as well as for constructing canoes and covering huts or wigwams. Sometimes the skins are tanned with the hair upon them by the savages, and curiously ornamented, and in this state find their way to the markets among the white people, where they are known as "robes," and made use of during winter by persons travelling in sleighs or sledges. These, however, in the markets of America, are far less common than the skins of buffaloes dressed in a similar manner, and known as "buffalo robes," one or two of which may be seen in every respectable settler's sleigh on a winter's Sunday at church or meeting, or on a week-day at the door of some village store. It is somewhat melancholy to reflect that this fine, innocent, and useful race of animals seems doomed to become extinct over the immense range of the western continent, wherever the foot of man—that lord of the creation—is destined to be planted.

Horns supposed to have belonged to the elk have been found in various parts of the world where these animals no longer exist, nor where any traditionary record inclines us to suppose they ever did. In various parts of England—in caves, caverns, and where deep excavations have been made in the earth—the horns, as well as certain bones of these animals, have from time to time been discovered. This also applies, and perhaps more particularly to Ireland, where many a noble pair of elks' antlers have been dug up from many feet beneath the earth's surface. Dr. Molyneux describes a pair found there several years ago which measured ten feet ten inches from tip to tip and five feet two inches in length, and which were eleven inches in circumference at their base. He makes an observation to this effect, that the head that had borne them bore no proportion to the great size of the horns. There is good reason to believe that these horns, as well as vast quantities of bones found along with them in Ireland and elsewhere (as in the caves in Yorkshire and Somersetshire), have been antediluvian deposits; for it has frequently happened that along with them were found the bones of several other animals that evidently, since the Flood, never have inhabited those islands, and such as are now only found in climates and countries differing greatly from ours. Recent writers upon natural history, and Cuvier amongst them, appear to be of opinion that those horns, however strong the resemblance they appear to bear to those of the elk at present found in America, have belonged to another and distinct species of this class of animals, which at the present day is entirely extinct.

Need of Instruction among the Peasantry.—Some time ago I was requested by a mercantile house in Australia to send out to them a party of shepherds, for the management of flocks. I accordingly procured sixteen from Kent, Wilts, and Norfolk, well recommended, no more than half of whom could read and write. On inquiry I learned that the uneducated parties, when boys, had been occupied in tending flocks, which prevented them from receiving any instruction. Surely, in an age like this, when in large towns institutions are established to instruct the mechanical classes, some method might be adopted to diffuse useful knowledge among our peasantry. We hear of schools for farmers being established on the European continent, and although this mode of tuition in England might not perhaps produce the effect desired, nevertheless I humbly conceive the object in view might be attained by some other expedient, and it would be to the honour and the credit of our leading agriculturists to have one devised. They themselves would eventually reap the benefit. A little public spirit is all that is wanting to remove what truly may be called a national calamity, if not a disgrace. Let us therefore begin systematically, and see that suitable pocket books, or manuals, are placed in the hands of the several classes of our unlettered peasants. To have poor children taught to read and write ought to be the bounden duty of the parish overseer, and no parent should be allowed to avail himself of the personal services of any junior member of his family until this has been accomplished. Thanks to the generous and benevolent dispositions of our resident nobility and gentry, in no village or rural district of the kingdom can poverty be pleaded as an excuse for the omission. When a peasant boy, for example, has made sufficient progress in the first rudiments, and is called upon to earn his livelihood in the open air, either by means of field-husbandry, or tending sheep, he ought to have a portable and strongly-bound tract put in his hand, written in a plain and elementary manner, on agriculture and the management of sheep, and containing lists of the ordinary fruit and forest trees; descriptions of the best methods of draining land, and an enumeration of the seasons for sowing, modes of planting and grafting, &c., accompanied by instructive plates.—*Treatise on Sheep, addressed to the Flock-Masters of Australia, Tasmania, &c., by Thomas Southey.*

Advantages of Commerce.—As the same country is rendered richer by the trade of one province with another; as its labour becomes thus infinitely more divided, and more productive than it could otherwise have been; and as the mutual interchange of all those commodities which one province has and another wants, multiplies the comforts and accommodation of the whole, and the country becomes thus, in a wonderful degree, more opulent and more happy; so the same beautiful train of consequences is observable in the world at large, that vast empire, of which the different kingdoms may be regarded as the provinces. In this magnificent empire, one province is favourable to the production of one species of produce, and another province to another. By their mutual intercourse mankind are enabled to distribute their labour as best fits the genius of each particular country and people.—*Mill's Commerce Defended.*

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HORSE ARMOURY IN THE TOWER.—IX. EDWARD VI.

[Edward VI.]

THE reign of Edward VI., so remarkable for the change effected in the character and dispositions of the people, through the means adopted to promote learning and the arts of peace, is necessarily undistinguished by any improvements or alterations of particular importance in military affairs. Devotedly attached to learning, alive to the necessity of educating the people, and deeply interested, above all, in the great work of carrying on the Reformation, Edward had little inclination for the chivalrous exercises which had enlivened his father's court. Instead, therefore, of appointing 'Gentle passages of arms,' and sending challenges to all the courts of Europe to meet him and his nobles in tilt and tourney, he was intent upon the means of encouraging literature, of promoting the fine arts, and extending commerce. It will be needless to dwell on the qualifications of this young prince for the important tasks he undertook. All writers concur in extolling the perfections of his mind and person, which at a very early age received the encomiums of his contemporaries. His tutor in the theory of government and state affairs, William Thomas, thus speaks of him:—"If ye knew the towardness of that young prince, your hearts would melt to hear him named, and your stomach abhor the malice of them that would him ill; the beautifullest creature under the sun; the wittiest, the most amiable, and the gentlest thing of all the world. Such a spirit of capacity, learning the things taught him by his school masters, that it is a wonder to hear say. And, finally, he hath such a grace in posture and gesture of gravity when he comes into a presence, that it should seem he were already a father, and yet passeth he not the age of ten years, a thing undoubtedly much rather to be seen than believed."

Edward was born at Hampton Court, on the 12th of October, 1537. He had been "brought up," as he tells us himself in his Journal, "till he came to six years old, among the women." He was then placed under the tuition of Dr. Cox and Mr. Cheke, two "well-learned men, who sought to bring him up in learning of tongues, of the scripture, of philosophy, and all liberal sciences." Burnet states thas Cox was appointed "to be his preceptor for his manners, and the knowledge of philosophy and divinity; the other for the tongues and mathematics." Another of the persons entrusted with the care of his education, according to Strype, was Sir Anthony Cook, "famous for his five learned daughters." He had also masters for the French language and other accomplishments. In all these studies he had made an uncommon progress for his years, and had been distinguished for a docility and diligence that would have been remarkable even in one who was not a prince and an heir to the throne. He was so forward in his learning, that before he was eight years

old he wrote letters to his father in Latin and French, and frequently to his sisters and others, and this not as a task or from vanity, but from inclination and to advance himself in the knowledge of languages. At the age of thirteen he was well versed in several tongues, and studied Aristotle's 'Ethics,' Cicero's 'Philosophy,' &c.

Besides the learning he had acquired by perseveranee and study, he has been commended for the mildness and amiability of his disposition; yet the contradictions which we so often meet with in historical documents, leave us in this instance uncertain whether he is deserving of the full meed of applause which the supposed possession of such qualities has procured him. Several incidents in his reign, such as the punishment of the Roman Catholics, and the burning of others disaffected to the reformed religion, may be attributed rather to his council than to him, since, though he gave his sanction to such proceedings, the facts may be supposed to have been so represented to him as to require the adoption of the course pursued. But there are other points in his history which would lead us to imagine him deficient in that amiability and ingenuous affection for which he has been extolled. His conduct on the attainder of his uncle, and throughout the proceedings consequent thereon, do not appear to be the promptings of a warm and tender heart. While Somerset lay condemned to death, the king was enjoying the merry festivities and pastimes of Christmas; the Lord of Misrule had contrived so well, "both in show of sundry sights and devices of rare invention, and in acts of divers interludes, and matters of pastime played by persons, as not only satisfied the common sort, but also were very well liked and allowed by the council, and others of skill in the like pastimes, *but best of all by the young king himself.*" Other shows and sports of the season are recorded at some length by the king himself in his Journal, with a spirit at sad variance with the cold laconic way in which, some few days after—on the 22nd of January—he notes that "the Duke of Somerset had his head cut off on Tower Hill, between eight and nine o'clock in the morning!" Such an entry seems inconsistent with an amiable and gentle disposition, yet mildness of character is not often unallied to a cold and apathetic temperament; and such, perhaps, could we see clearly, was that of Edward VI.

The ease with which he complied with the demands of those about him, and especially the readiness with which he fell into the plans of the Duke of Northumberland with respect to the succession (by which his sisters, to whom he always professed to be so much attached, would be excluded from the throne), are additional evidences of his indifference and want of feeling.

But perhaps we are dwelling too strongly on these points in his character; it is presumptuous to expect that our admiration should be completely unalloyed; and since perfection, even in princes, has never yet been found in man, we should be content to set forth as an example to others him whom every one considers to have been the best prince of his time.

Mr. Sharon Turner, in summing up his character, makes the following observation:—"His mild disposition, his intelligent mind, his acquisitions of knowledge, his unfeigned piety, his patriotic spirit, and his ambition of doing good, promised a reign of no ordinary individual excellence and political prosperity; but as he had acted so little for himself, and when he did so, had not always displayed that judgment and moral firmness without which even virtue will not pass from the intention efficiently into the act, we are not authorised to assert that his maturity, if he had reached it, would have realised the promise, or have diminished the imperfections of his youth."

The armour in the Tower of this date to which the name of Edward VI. is attached, has nothing particular to distinguish it from the armour commonly worn at the time, except that it is "russeted," an effect produced by oxidizing and then smoothing the surface of the metal. It is also highly enriched with gold, which has here a much more beautiful appearance than when inlaid on black. Russet armour had also this advantage, that it could be kept clean much more easily than polished steel. A very fine specimen of this kind of armour is in the possession of Llewellyn Meyrick, Esq., by whom it was obtained from a chateau in Brie, which belonged to the Ducs de Longueville.

One striking distinction in the form of armour of this period is to be found in the breastplate, the tapul of which, from having at first bulged out at the breast, had gradually descended, and now projected from the very bottom of the breastplate, having very much the appearance of a peascod, from which this form of the breastplate became named. Instances of this form are to be found in the brass plate of John Spellman, in Narburgh church, Norfolk; also in the monument of Sir Ralph Sadeler, in Hertfordshire; and in that of the Smyths, in Ashford church, Kent.

Sir S. L. Meyrick describes a curious helmet of this period in the armoury at Goderich Court, which deserves to be mentioned here. In ordinary helmets, the beaver is raised to uncover the face, but in this it falls down to the chin to effect this purpose. On the top plate of it is a horizontal bar, which, meeting the umbril when up, forms the visor. The beaver is formed of three pieces, which, when covering the face, hold by as many little catches.

The beaver is made to take off and on, and when off there appear three bars, joined at the bottom by a concave piece to cover the chin, and fastened to the umbril by a wire, on removing which the bars may be taken off.

The figure of Edward in the Tower carries a mace in his right hand, while he points with his left to some object respecting which he is supposed to be giving his orders. The mace, however, was seldom used at this period, the pistol being substituted in its stead; which, also, in course of a short time, came to supply the place of the estoc, or small stabbing sword. The pistol had been for some time previous to this used in conjunction with the mace, forming a double weapon, so that when the pistol had been fired it might immediately be brought into use as a mace. These pistols were called "dags," as "long," "short," and "pocket dags,"—a curious term for a fire-arm, as the French "dague," from which it has been supposed to have been derived, signifies a small sword or dagger; yet it is not a little singular that in Italian, "pistolese," from which it is generally supposed our name for a small kind of fire-arm was derived, means merely a great dagger, or wood-knife.

BURGHLEY HOUSE, NORTHAMPTONSHIRE.

[Concluded from No. 527.]

We now pass to the new state bed-room, or second George room, in which is a bed that has been considered to be the most magnificent in Europe. It stands upwards of twenty feet high, the top forming a dome, supported at each angle by lofty carved and gilt columns springing from tripod pedestals. Over the dome is a large plume of ostrich feathers delicately worked in wood, and the edges tinged with gold. The hangings contain 250 yards of beautifully striped coral-coloured velvet, lined with 900 yards of white satin. The bedstead is independent of the canopy, and by means of simple machinery easily removable, when the whole of the remaining part assumes the appearance of a splendid throne. This superb piece of furniture cost nearly 3000*l*. The chimney-piece here is very beautiful, composed of red and white marble, ornamented with a tablet representing the sacrifice of a goat; the metal-work attached is inlaid with silver. The ceiling is painted with subjects chiefly from the heathen

mythology, by Verrio. Among the pictures in this room is one by West, of Agrippina with the ashes of Germanicus, a rich composition, with a nobleness in the figures, and in some of them real feeling. Leaving this room we are ushered into the great drawing or third George room, which is very rich in paintings. There is an excellent portrait of a Venetian, by Sophonisba Anguseiola, of the Lombard school; a painting of great effect, by Michael Angelo da Caravaggio, 'Peter denying Christ;' and a picture of 'The Assumption of the Virgin,' a great work, by N. Poussin. The room also contains a Medusa's head, in white marble, by Nollekens, a copy of the Portland Vase, &c. The fourth George room contains two landscapes by Claude Lorraine, remarkably long and narrow in shape, of the middle period of the master, and are peculiarly charming by composition, force, and freshness of tone. There are also various other works of great value. 'Christ delivering the keys to St. Peter in the presence of St. John and the two Marys,' is by Giovanni Bellini, of the Venetian school. It is a very finished work of the later period of the master, extremely noble and refined in feeling, and delicately executed in a bright tone. 'Gathering the Manna,' by Giacopo Bassano, is a rich, carefully executed, very well coloured picture: 'The Prodigal's Return,' by the same artist, is a remarkably good work. A Magdalen, by Baroccio, of the Roman school, is a genuine and good picture. We may last mention a picture by Guercino, 'Jacob receiving the bloody coat of Joseph,' which is very carefully executed, and remarkably clear in its colouring. The fifth George room is devoted, in painting, to the works of Verrio, the walls as well as the ceiling being covered with his productions. It contains besides, a model, by Nollekens, of Niobe and her Children, and various sculptures, antiquities, &c. Passing from hence we find the grand staircase, or, as it has been somewhat startlingly designated, the Hell, from the poetic representations of the Tartarus of the heathens, painted by Verrio on the ceiling. It would be scarcely possible to find a more striking contrast between the style of two different masters than is furnished here by the ceiling painted by Verrio and the walls painted by Stothard. The last includes three large pictures by this gifted artist: 'The Banquet given by Cleopatra to Mark Anthony;' 'Orpheus leading the shade of Eurydice from the Infernal Regions;' and 'The Terrors of War.' Here we find all Stothard's poetry of invention, all his grace of attitude, but also much of the feebleness of his drawing, which the large dimensions of the pictures make but too apparent. On the top of the staircase stands a boy on the back of a dolphin, in marble, by Nollekens. We are now conducted from the staircase into a saloon, the east end of which brings us once more into the great hall; crossing to its west end we find the dining-room, the ceiling of which is supported by four richly gilt Corinthian pillars. The chimney-piece, of white marble, is beautifully inlaid and supported by Siena marble. Here, on magnificent sideboards, is an extraordinary display of plate, including four very large silver dishes, presents made to the earls of Exeter when officiating as almoners at the coronations of James II., Anne, and George I., and a silver cistern, said to be the largest of its kind in England, containing 3400 ounces of silver. Here too the paintings are alike numerous and admirable. 'Diogenes on the point of throwing away his drinking-cup as useless,' is by Murillo, a picture conceived with great skill in the natural manner of his beggar-boys, yet rather dark, especially in the shadows. 'The Passage of the Israelites through the Red Sea,' by Benedetto Castiglione, is, by its size, the richness of the composition, and the careful execution, a capital picture of the master. 'The Wise Men's Offering,' by Licinio Pordenone, is a rich and admirable picture. Speaking of this, and the other work of the same master at Burghley, 'The Finding of Moses,' M. Waagen says, I do not know any gallery which can boast two such works of this rare master, here erroneously called Bassano. In 'The Finding of Moses,' by Andrea Schiavone, in this room, the composition is very graceful, and the heads more than usually animated. There is, lastly, a landscape by Hobima, with the figures by Ostade, of the best time of the master. The other rooms we are about to mention are not generally shown to visitors; we shall therefore pass hastily over their contents. The marble hall is sumptuously furnished, and contains some paintings, books, &c. In the blue drawing-room are a picture of 'The Marriage of St. Catherine,' by Andrea Schiavone, pleasing in the leading lines, glowing in the colouring, and 'The Entombment,' by Tintoretto, a picture warm in the colouring, and noble in its character and composition. The green dressing-room contains several interesting pictures: 'Queen Elizabeth at an advanced age,' by Marcus Gerards; she seems to have been quite in a dignified mood when she sat for this picture. Coldness and pride are expressed in those sharp features. The picture appears very tasteless with the rich stiff lace ruff, and with the excess of ornaments of all kinds, jewels, pearls, &c. A picture by Le Sueur, 'Mary Magdalen anointing the feet of Christ,' is in the pure taste and true feeling which distinguishes Le Sueur from most of the French artists. 'The Nativity' of Carlo Dolce is very excellent in composition, force, and fullness of colour, as well as in its delicate finishing. Another picture on the same subject in this room is, says M. Waagen, by Albert Durer, although attributed at Burghley to Herri de Bles: it is a small but beautiful picture. In the japan closet we find a very graceful, warm, clearly coloured picture, by Albano, 'Galatea combing her hair,' and a portrait of the famous Lord Burleigh, by Marcus Gerards. In the glass cases or cabinets there are a great number of pictures, comprising an excellent collection of miniatures and enamels, among which are masterpieces by the celebrated Petitot, Isaac Oliver, and John Hoskins. The crimson velvet bed-room is hung with tapestry representing subjects from Æsop's Fables, and the dressing-room attached contains a portrait of William Cavendish, duke of Newcastle, executed with great delicacy and elegance. In the libraries are some valuable manuscripts, and a great number of rare books, also some antique Roman altars. Besides all the rooms we have mentioned, those appropriated to the use of the superior servants abound with pictures, although generally of little value, being copies. The total number of rooms in this immense structure, according to the 'Guide to Burghley House,' is 145, all of which are appropriately furnished and kept in perfect order.

The kitchen, a noble vaulted Gothic building, measuring 48 feet by 30, and lofty in proportion, stands, with several other buildings, detached from the principal part of the house. At a short distance west of the mansion is an elegant bridge, by Brown, with lions couchant at the four corners; and by this artist were the park-grounds laid out with a success in scenic effect equal to his best efforts, and ornamented with summer-house, grottoes, &c. The north front of the house commands a view of a wide tract of country over the river Welland. From the south the prospect is still more extensive, being bounded by different places in the counties of Rutland, Leicester, and Lincoln. In the house and grounds there yet remain many objects worthy of attention, but our space forbids our entering more into detail; we have enumerated all the more important, and the remainder are easily better ascertained on the spot.

Dispatch.—True dispatch is a rich thing; for time is the measure of business, as money is of wares; and business is bought at a dear hand where there is small dispatch.—*Bacon's Essays.*

AVIGNON.

[Avignon and the old Bridge over the Rhône.]

THE pleasant situation of Avignon, the charms of the country which surrounds it, adorned with meadows, orchards, and mulberry-plantations, the beauty of the women, and the vivacity and liveliness of the population, together with its historical associations, render it a deserving object of interest to the continental traveller. It is, however, above four hundred miles from Paris, lying in a direction south-south-east of the capital, and is therefore chiefly visited by those who intend making the tour of Italy. Hence the interest with which it is regarded is perhaps eclipsed by subsequently visiting cities of still greater renown. Avignon is eight degrees south of London, and has to a considerable degree all the characteristics of the south. On the western side the Rhône flows past its ancient walls, and a promenade planted with elms encircles the remainder of the city. The river is here broad, deep, and rapid, and the wooden bridge by which it is crossed is of great length. In the twelfth century the erection of a stone bridge of nineteen arches was commenced by St. Benezet, a shepherd-boy of eighteen, but he died before its completion. In 1699 the violence of the stream carried away the greater part of this bridge, leaving only four arches standing. The origin of Avignon has been ascribed by some to the Greeks, who planted a colony at Marseilles, but it is certain that the Romans established themselves here at an early period of their dominion in Gaul. For seventy years Avignon was the residence of the popes, and this circumstance has contributed the most widely to its historical celebrity, and is of itself a remarkable event connected with the establishment of that singular supremacy which the popes have exercised for so many centuries. The causes which led to the Avignon "Captivity," as it is called, are worthy of a brief notice.

The feeble successors of Charlemagne being unable to grasp with firmness the dominion which he had established over nearly every part of Europe, Italy especially became a scene of distraction from the want of some heavy hand to press upon the factions by which it was torn. Many cities assumed their independence and became little republics, and other parts of the country were parcelled out into small feudal states. The feudal princes often ravaged each other's territories, and bloody disputes arose between one great city and another. During this period the kings of Germany, who styled themselves the successors of Charlemagne, still held the nominal sovereignty of the greater part of Italy, assuming the title of kings of Italy and emperors of the West; and their claims added still further to the elements of strife. Rival candidates struggled for the Italian crown, and the republican cities and petty sovereigns engaged on one side or other as fear or interest directed their policy: the celebrated factions of the Guelphs and Ghibellines had their origin in these contests for the Imperial crown. The power of the popes suffered materially in the course of these events. The emperor Henry III. deposed three popes in succession, and eventually the emperors and the popes became the chief contending parties, and Italy still continued their battle-field. Each had their allies, and for a considerable period the main political interests of the sovereigns of Europe were decided in Italy.

In 1305, Philip le Bel, king of France, induced pope Clement V., who was a native of that country, to remove his court and residence to Avignon. Gibbon says that the popes were disgusted with the rebellious spirit of the Romans, and Philip doubtless conceived that it was a master-stroke of policy to concentrate the papal influence in his own dominions. The change, however, contributed materially to impair the influence of the Papal see. Mosheim states that during the absence of the pontiffs from Rome, "the faction of the Ghibellines, their inveterate enemies, rose to a greater height than ever; inso much that they not only invaded and ravaged St. Peter's patrimony, but even attacked the papal authority by their writings. Even Rome itself was the grand source and fomenter of cabals, tumults, and civil wars, inso-

much that the laws and decrees sent thither from France were publicly treated with contempt by the common people. The influence of this example was propagated from Italy through most parts of Europe, it being evident, from a vast number of incidents, that the Europeans in general did not pay near so much regard to the decrees and thunders of the Gallic popes as they did to those of Rome." To make up for the loss of the pontifical revenues, it was necessary to adopt other means of replenishing the papal funds, and the sale of benefices, indulgencies, and absolutions was carried to an extent which it was subsequently found difficult to repress when in calmer times such practices came to be loudly denounced as scandalous and injurious to religion.

On the death of Clement V., in 1314, John XXII., also a Frenchman, was elected after a struggle between the French and Italian party, which lasted two years. Similar contests took place at several successive elections, until at length one pope was elected at Rome and another at Avignon. This unseemly proceeding is called the great Western schism, and those popes whose authority is not recognised by the Catholic church are termed anti-popes. Gregory XI. determined upon returning to his capital, but he died very shortly after reaching Rome. The conclave, who were met to elect his successor, were menaced with instant death unless they appointed an Italian; and in their alarm they complied with the wishes of the people, but afterwards protesting against their first election, they elected a Frenchman; but both assumed their right to the papal chair. Italy, Germany, and England acknowledged the pope of Rome; France and Spain recognised the authority of the pope of Avignon. "Each," says Gibbon, "had his adherents, his doctors, his saints, and his miracles, but their mutual excommunications, which, at another time might have produced a battle of swords, only occasioned a war of pens." The period of the Avignon captivity, as the Italians styled the seventy years' absence of the popes from Rome, terminated with the death of Gregory XI. in 1377, but the schism in the Western church was not put an end to until 1449, when Nicholas V. prevailed on Felix V., who had been elected by the Council of Basle in 1439, to abdicate in his favour. At the same time the sovereigns and states of Italy, as if actuated by the same desire for peace, forgot their differences for a time, and war ceased for several years. Soon afterwards the Papal States gradually assumed a more regular form, and the temporal power of the popes became firmly consolidated.

Pope Clement VI. purchased the city of Avignon, in 1348, of Jane, countess of Provence and queen of Naples, and it continued to belong to the sovereign pontiffs until it was seized in 1791 by the French. In 1474 Sextus IV. raised the see from a bishopric to an archbishopric, and it still continues an archiepiscopal see. Under the popes Avignon was governed nominally by a cardinal-legate, but as he was always non-resident, the duties of his office were executed by a vice-legate. The inhabitants always retained their rights as natives of France, in being eligible to civil and ecclesiastical offices; but they were under various local courts, which were abolished when Avignon was made the capital of a French department. The kings of France at all times exercised jurisdiction over the Rhône.

The noise of the church bells during the residence of the popes occasioned Rabelais to give to Avignon the name of "La Ville Sonante." At one period it contained twenty religious houses for men, and fifteen for women, besides collegiate churches, served by a numerous body of ecclesiastics; and so recently as 1762 the number of ecclesiastics in the city was estimated at 900.

The cathedral was formerly of considerable magnificence, but it wants uniformity. The portal is supposed to have once formed a part of an ancient temple of Hercules. Here are the tombs of several popes. The church of the Cordeliers, the site of which was lately and perhaps still is a fruit-garden, contained the tomb of Laura de Sade, Petrarch's mistress; and in the church of the Celestines there is the tomb of pope Clement VII., and that of St. Benezet, the architect of the old bridge over the Rhône. An ivory crucifix, exquisitely carved, the workmanship of the sixteenth century, and regarded as one of the great curiosities of the city, is in the church de la Miséricorde. The palace of the popes, a large Gothic pile, is now converted into barracks.

The silk-manufacture is the principal source of employment at Aviguon, and the rearing of silk-worms is carried on extensively in the neighbouring district; madder is also cultivated, and there are some iron-works in the city. The Rhône facilitates the transmission of commodities to Marseilles by way of Arles. The population of the commune, in 1836, was 31,786, having increased little more than one per cent. per annum since 1831.

SKETCHES OF THE COASTS FROM SINCAPORE TO PEKIN.

I.—From Sincapore to Camboja.

[From a Correspondent.]

At a time when the affairs of China occupy so large a space in the public mind, it may not be useless to sketch a rapid outline of the scenery and nations that lie between the farthest British settlement in the Indian Ocean and the shores of that vast empire. We are the more tempted to undertake this task by considering that although many detached pieces of information are to be found scattered up and down the pages of voluminous works—systems of geography, voyages and travels, &c.—yet nowhere do we meet with a comprehensive view of the coasts and islands that fall under the navigator's eye in crossing those seas. An elaborate and minute description it is not our intention to offer. We shall imagine we have performed our duty, if, in a few pages, we enable the reader to have distinct ideas present to his mind when he hears, as he now often will, of voyagings to and fro between Sincapore and Canton.

Sailing then from the harbour of Sincapore, we begin to thread our way through that intricate archipelago that clusters like a swarm of bees round the promontory of Malacca, and stretches westward as far as the shores of Sumatra. On all sides the entrances of narrow straits and creeks appear, dividing, or seeming to divide, the green eminences and clumps of tall trees from each other. Tropical birds rise ever and anon from the branches, and wheel across from shore to shore like flakes of gold and purple driven before the wind; whilst here and there, doubling some point or shining above the yellow sand-banks, white sails are seen bending before the wind and moving cautiously along to avoid the hidden rocks and bars that render navigation in these parts so dangerous. To the left, as you approach the narrow exit of the principal straits, the great river of Johore, or Batasahas, pours its waters into the sea, after having passed by the ancient capital of the same name, over which that king reigns from whom, by cession, we obtained our footing in Sincapore. Before, however, the British flag waved triumphant in these straits, the maritime Malays were the sole sovereigns of these channels, paying tribute, it is true, to the king of Johore, but otherwise leading a lawless life, watching about for what ships were cast away and plundering unscrupulously, or else exchanging the spoil of their hook and spear (for with both did they procure fish) for knives, tobacco, and other trifles. They were said to be a rapacious and vindictive set, like all other Malays: their dress was a kind of jacket and a linen petticoat, both for men and women. The latter wore their hair dishevelled over their shoulders; but the former shaved, retaining only a huge pair of moustaches.

A small linen rag served them in lieu of a turban, and a knife and spear were their sole arms.

This singular people dwelt in covered boats with their wives, children, dogs, cats, and hens. They were called by travellers both Salsettes and Salittas; and it is extremely probable that it was they who degenerated into those ruthless pirates who but lately swarmed in all the neighbouring seas, scouring the coasts, seizing the ships, murdering, under the influence of opium, every passenger on board; and then, having rifled the treasure, abandoning the vessel to be driven about like a floating charnel-house at the mercy of the waves, until it either went to pieces, or served to tell the melancholy tale to future passengers. Every island and rock in these seas once formed a retreat for such ruffians, to whom now happily has succeeded a more harmless race of fishermen and traders, although, at times, the dreadful memento above alluded to still shock and terrify our merchant ships.

The tides in the Straits of Sincapore are rapid and irregular, now pouring southward, now northward; sometimes to the west, at others to the east; changing without apparent rule, and, by reason of their influence on the shifting sand-banks, rendering all knowledge of the soundings little to be depended upon. Nor are the motions of the air less variable. In all tropical countries calms and storms alternate with extraordinary rapidity; but on these shores nature seems to teem with exceptions to the general rules she has elsewhere laid down. Whilst the ship lies motionless on the sea, and the crew is lounging about in all the inactivity of a calm—whilst the treacherous element itself is smiling faintly like a slumbering infant, suddenly a storm pours invisibly through the air, unaccompanied by clouds, and, ere a hand can be raised, tears the canvass to stripes, shivers the mast, sometimes sending the vessel to the bottom, and then passes on, leaving the agitated waters to subside over its victims. Such were the terrific accidents which gave rise to the opinions formerly prevalent among the Canton pilots, that in these streights the current of air was so violent, that it whirled a ship about with all its sails abroad. It is, however, between Malacca and Sincapore, and from thence to Pulo Timaon, that these sudden tempests and calms are most frequent. Cape Romania, which runs out and forms a kind of semicircle round Sincapore and the adjacent islands, protects the straits in some sort.

Doubling this cape, the ships bound for China take a north-easterly course, in order to avoid the multitudinous shoals and islands that choak up this part of the sea. One of these is called the White Rock, and has a legend connected with it concerning a Portuguese, who, imagining that he had passed it, exclaimed, that "now God could not make him poor." At that instant his ship, says the story, struck, and he went to the bottom. The largest of the islands on this coast are Aor and Timaon, both mentioned by Dampier. It was off the latter that Mendez Pinto was sailing in 1540, when, a little before day, he heard at two several times great lamentations at sea. Whereupon he and his ship-companions debated as to whether they should sail on their voyage or turn aside: curiosity prevailed, and they remained until dawn, when the fragments of a vessel appeared, upon which hung three and twenty men, who, wrecked off Java, had been driven by wind and tide in a most miserable condition to this place.

Pulo Timaon is inhabited by Malays, who go nearly naked, with their hair flowing loosely over their shoulders. They live in houses constructed entirely of reeds, and raised seven or eight feet from the ground on stout bamboos, to protect them as well from the noxious vapours of the night, as from the wild beasts that prowl about, and against which their slender spears are but poor defences. A rough ladder admits them into the screen of mats that surmounts this scaffolding, and here they pass their lives with their families, ranging by day the woods in quest of the feebler inhabitants of the forest, or launching out their little canoes to obtain fish among the shoals, where they are most exposed to their aim (for the spear serves them on both elements). They dwell dispersed, and not in villages; each constructs his hut where it pleases him, on the border of some bay or some rivulet that is commodiously situated for his amphibious occupations. When ships make the island, they send their women up into the interior; but generally give the crew an amicable reception, and furnish them with abundance of fruit and fish in exchange for a few European commodities. The aspect of the island is delightful, for it is from end to end clothed with a forest of trees of the most varied nature, some rearing their lofty heads to a hundred feet above the soil which gave them birth. The inhabitants make no use of the wood, since they have abundance of bamboos, which are much more easily fashioned. The atmosphere of this and the neighbouring islands is balmy in the extreme; and if partially cleared of wood, would be healthy and in all respects delightful.

Sailing still northward, along the shores of the Golden Chersonese, rising in lofty mountains and covered with waving woods, we come at length to the harbour of Pahang. The town itself lies twelve miles up the river, but although the æstuary is a mile broad, the sand banks are so numerous that ships of thirty tons can scarce work up. The bed of the river contains abundance of gold, for which the natives dive continually, and with such success that some years eight hundredweight have been exported.

The banks of the Pahang rivers are planted with pepper-trees, indeed any amount of this valuable commodity might be produced here. Three hundred tons have been sent to market, and, were there a demand, more than five thousand could be raised in five years.

The next town on the coast is Trangano, or Tingoram, seated on a river in the midst of low hills, clothed with a multitude of evergreen trees,—the lemon, the orange, the mangostan,—whilst the valleys are covered with grain, all kinds of pulse, and sugar-canes. Pepper also is raised here; but all the winter the port is rendered inaccessible by a great sea which tumbles into it, driven by the north-east monsoons.

Passing onwards by the group of islands called Redang, rendered infamous by the Malay pirates who were wont to resort thither, we at length come to Cape Patane, running northward and forming a great bay, at the bottom of which is situated a town, of the same name as the Cape. It was formerly the capital of a powerful kingdom, extending to the borders of Johore. In the height of its glory it was said to be able to bring into the field a hundred and eighty thousand men. The inhabitants are a lazy and licentious set, but at the same time arrant water-drinkers, wine and liquors being their aversion. The air is excessively hot, but not unwholesome, and the country, now called Tringany, is fruitful in the extreme.

Leaving the Gulf of Siam to the left, and avoiding the rock of Pulo Lozin, which is surrounded for about two leagues with an oozy bed, nearly two hundred miles clear sailing brings us in sight of Pulo Oby, which first presents one round hill, but on a nearer approach you discover a shoulder of land which stretches out from the peak, and rises, as the sailors phrase it, in hummocks. Trending still north-westward, we have, on the one hand, the coast of Camboja, and on the other the islands of Condore (in Chinese Kwan-hiu) about fifteen leagues from the shore.

The principal island, from which the others take their name, is in form like a crescent, and is twelve miles long and three broad. It has a long edge of peaked hills, all well wooded. Here the mango, the cabbage pechu, the coco, a species of bastard nutmeg, without taste or smell, and the vine grow wild. To these the French have added water-melons, potatoes, gourds, plantains, oranges, shaddocks, pomegranates, rice, and black beans for the use of navigators, this island being much frequented by ships

bound to and from Japan, China, the Philippines, Tonquin, and Cochin-China. The thickets afford retreats for the wild hog, the iguana, the poisonous gecko and other lizards; buffaloes pasture in the meadows, whilst monkeys and two species of squirrels, one of a beautiful shining black, and the other, of the kind called flying, striped brown and white, together with parrots, paroquets, turtle-doves, pigeons, wild cocks and hens, inhabit the trees. A curious species of sloth is likewise a native of this island, one of which, being carried on board a ship that touched there, brought forth on board, and then very leisurely crawled up the rigging, dragging the young one behind. For ten months in the year many fresh-water brooks run into the sea, at the mouths of which and along the shore the fishermen find mussels, limpets, and turtles. From the fat of the turtle the inhabitants draw some oil, which they export to Cochin-China, together with the juice of a large tree, probably the damma, which they boil into excellent tar, and even into hard pitch.

The natives themselves are from Cochin-China, mean in stature, but well shaped, dark in complexion, with black straight hair, eyes small and of the same colour, high noses, small mouths, thin lips, and extremely white teeth. They are poor, but very civil and sociable. They worship the elephant and the horse, together with other images of birds and fish. On the whole they are an amiable and inoffensive people.

On this island it was that the director of the East India Company at Chusan attempted to form a settlement, when he was compelled to abandon his factory on the coast of China. But for his own ill-conduct he might have succeeded, for in the second year of the eighteenth century, having engaged a number of Malays to act as soldiers for three years, he refused to give them their liberty at the end of that term, whereupon they rose in the night, massacred him and most of his crew (some few making off in a boat), and then escaped to Macassar, whence they had been brought. No European has since resided in this island, and accordingly the natives have not yet become accustomed to strangers. Probably also they have received some unfair treatment at the hands of the sailors who touch at this island, since, when Lord Macartney's squadron anchored in the spacious bay on the eastern coast, the inhabitants of a small village built close to a sandy beach at first affected to receive them without suspicion, but abandoned their dwellings in the night, leaving a petition praying the powerful strangers not to destroy what they left behind.

Camboja is a low woody country, like Tonquin. The land is prodigiously fertile, yielding almost everything, both animal, vegetable, and mineral, that is found in all these latitudes. Among other commodities, ivory and gold, sandal-wood, sapan-wood, aloes wood, sticklac, dragon's blood, rice, and gamboge, together with oranges, citrons, mangoes, and coco. Deer abound in the forests, horned cattle in the plains, whilst hogs, wild and tame, goats, hares, cranes, and all kinds of poultry, contribute to render provisions abundant and cheap. This country is little frequented by the English, but the Portuguese once carried on an extensive trade with the inhabitants, bringing from thence, besides the articles we have mentioned, benzoin, brass vessels, and bars of Chinese iron. The city of Kiang-kong, at the mouth of the river of the same name, carries on a great trade in mats with Sincapore.

The river of Camboja is said to run many hundred miles up the country, and to flow out of a great lake, as do most of the rivers in that kingdom. On this point, however, we are compelled to rely entirely on the reports of the natives, no European traveller having penetrated more than a few miles up the stream. The capital is placed by some at ninety, by others at two hundred miles inland. It consists of but one street, running along the brow of a hill, to preserve it from the inundations which rise annually, as in Egypt. Indeed all these countries are subject to the same apparent inconvenience. The Siamese river Meinam, which is said to be connected with that of Camboja by natural channels, annually overflows, for which reason the houses are built in the same manner as those of Pulo Timaon. The floods rise so high that the inhabitants are said to go forth in boats from their windows to gather the rice that floats upon the waters. It will be seen that Cochin-China is also subject to these overflowings, which seem to be a wise provision of nature for watering the earth and clearing the land of insects and all those other noxious animals that abound in low and swampy countries. The capital is near the site of the metropolis of the ancient Thinæ, and it has been said that extensive marble ruins have been discovered to the north-west of the modern city. This ancient nation is reported to have traded with Barygaza, the modern Baroach, in the west of Hindustan, in wool, thread, and *othonium sericum*, which were carried by men. Two Arabian travellers, who visited the kingdom of Camboja in the ninth century, report that the finest muslins in the world were manufactured there, and that the people wore garments woven so fine that they might be drawn through a moderate ring. The same travellers mention the rhinoceros (unicorn), and the country is known to abound with elephants, whom the Indian Portuguese shoot with poisoned bullets, together with buffaloes, which are killed in the same manner, for the sake of their tongues.

[To be continued.]

ON THE CULTIVATION AND QUALITIES OF GINGER.

The ginger plant, *Amomum Zingiber*, is a native of India, growing wild on the Malabar coast, in Bengal, and in Ceylon. It also grows naturally as well as in a cultivated state at Gingi, in China, and hence in all probability is derived its common name. It is cultivated in most of the tropical regions of Asia and America, especially in the West India Islands; and Jamaica ginger is considered to be greatly superior in quality to that obtained from the East.

The Dutch seem to have been the first to introduce ginger into England; for Gerard states that in 1566, "an honest and expert apothecarie, William Dries," sent him an account of the spicy-rooted plant. "To satisfy my desire," says Gerard, "he sent me from Antwerp to London the picture of ginger, because I was not ignorant that there had been oft ginger roots brought green, new, and full of juice, from the Indies to Antwerp; and further, that the same had budded and growne in the same Dries's garden." At a later period he writes:—"Ginger is most impatient of these our northern regions, as myself have found by proofe; for that there have been brought unto me at several times, sundry plants thereof, fresh, greene, and full of juice, as well from the West Indies as from Barbaric and other places, which have sprouted and budded forth greene leaves in my garden in the heate of somer; but as soone as it hath bin but touched with the first sharp blast of winter, it hath presently perished both blade and roote."

The root of the ginger plant is biennial; while the herbaceous part of the plant is annual and withers away in the month of December. The creeping and tuberous root increases under ground, and sends up many green stalks. These stalks are generally three or four feet high, and are enveloped by the smooth sheaths of the leaves; they terminate in oblong scaly spikes, having a single blue and white flower arising from each scale.

In a rich cool soil the plant grows very luxuriantly. The land is prepared by hoeing and trenching; and in March or April the ginger is planted,—the smaller pieces of the root being selected for the purpose. The cultivation requires little skill or care, but is carried on with as much ease as the propagation of potatoes in England.

The plant attains its full height, and flowers in August or September; fading at the close of the year. In the month of January or February, when the stalks have entirely withered, the roots are fit to be taken up; they are then picked, cleansed, and prepared for sale. The ginger of commerce is distinguished as *black* and *white* ginger, the difference in which wholly arises from the methods employed in curing them. Black ginger is scalded in boiling water, and then repeatedly exposed to the sun till it is sufficiently dried. That this scalding may be effected without loss of time, a large cauldron is fixed in some convenient part of the field, and water kept constantly boiling. The picked ginger is divided into small parcels, laid in baskets, and immersed in the water for the space of ten minutes or a quarter of an hour; from whence they are removed to the platform where the ginger is to be dried. When the water in the cauldron becomes much impregnated with the juice of the root, a fresh supply is brought, and the process goes on as before. It has been suggested that this scalding of the root is done in order to destroy the life, and thus to expedite the drying of it for sale.

That which is intended for *white* ginger is never scalded, but each root is picked, scraped, and washed separately, thereby improving the appearance without adding much to the real value. It is frequently washed in whiting and water, or bleached with chloride of lime: the *white-washing*, as it is termed, is for the preservation of the root from the attacks of insects, as well as to increase its whiteness. White ginger, from being made more agreeable to the eye, commands a higher price in the market than black.

When the ginger is to be preserved in sugar, the young roots are taken up while they are green and juicy, and when the stems rise to only five or six inches in height. They are first scalded till they are tender, and then placed in cold water, where they are peeled and scraped and allowed to remain a day or two, the water being frequently changed during that time. They are then placed in unglazed jars, and a thin syrup poured over them; in two or three days more this syrup is removed and a richer quality put in; sometimes this also gives place to a third and even a fourth. These syrups are not wasted, for with the addition of a few other ingredients, and when diluted with water, they are fermented into a pleasant liquor, called in Jamaica "cool-drink."

Ginger is allowed to be an excellent carminative.* It is less liable to heat the constitution than might be supposed from its warm and pungent taste. It excites the vessels to brisker action, and is said to strengthen the memory and the sight; but of this we more than doubt. The dried roots are sometimes pounded and used with boiled milk to make ginger-tea; a tea-spoonful or two, according to taste, in a pint of milk sweetened with sugar, forms a beverage which, drunk morning and evening, is said to remove a number of nervous and dyspeptic symptoms.

The root of the ginger-plant is eaten fresh and green in India and China, by way of salad; being chopped small and mixed with herbs. Many of our receipt-books give directions for making ginger-bread, ginger-beer, ginger-wine, &c.; the former, when properly prepared, is both agreeable and wholesome; and the two latter make excellent drinks for the warm season of the year. Candied and preserved ginger are chiefly used as sweetmeats; they form, however, excellent stomachics, and are often found beneficial to persons of cold and phlegmatic constitutions. Ginger is a valuable adjunct to several other remedies; a small quantity of it may be added with advantage to doses of senna, jalap, &c.; and united with rhubarb it forms a good stomachic pill. The root is sometimes chewed for the relief of toothache. Besides the forms which we have already mentioned in which ginger is sold, there are lozenges, pearls, tablets, syrup, tincture, and essence of ginger. It is also largely employed in pickling and in other branches of the culinary art.

In the choice of ginger, large, fleshy, and plump pieces are to be preferred; heavy, free from moisture, nearly inodorous, and not worm-eaten. When cut, it should prove rather mealy, and of a pale buff tint, quite free from any musty smell. It is rather apt to become damp, and when kept in a cask will grow mouldy: a dry place and exposure to the air are therefore necessary for its preservation. In the form of a powder, it is often adulterated with bean-meal and boxwood sawdust; and in order to supply the deficiency which would be discovered in its pungent quality, a little capsicum is added. Ginger gives its flavour to water, to alcohol, and to æther; hot water obtains from it a considerable portion of matter resembling starch. By simple distillation, a limpid reddish oil is obtained from the root.

* The term *carminative* is applied to such medicines as act promptly in allaying pain and flatulency of the stomach and bowels.

Bad Translations.—It was no bad remark of a celebrated French lady (Madame de la Fayette), that a bad translator was like an ignorant footman, whose blundering messages disgraced his master by the awkwardness of the delivery, and frequently turned compliment into abuse, and politeness into rusticity.—*Goldsmith.*

Influence of Towns.—The influence that the growth of a large town has upon agriculture is great and striking. "In the neighbourhood," says Dr. Paley, "of trading towns, and in those districts which carry on a communication with the markets of trading towns, the husbandmen are busy and skilful, the peasantry laborious; the land is managed to the best advantage, and double the quantity of corn or herbage (articles which are ultimately converted into human provision) raised from it, of what the same soil yields in remoter and more neglected parts of the country. Wherever a thriving manufactory finds means to establish itself, a new vegetation springs up around it. I believe it is true that agriculture never arrives at any considerable, much less at its highest, degree of perfection when it is not connected with trade; that is, when the demand for the produce is not increased by the consumption of trading cities."—*Moral Philosophy*, book vi., cap. 11.

Sanatorium in the Metropolis.—An institution has been projected to provide, for those of the upper and middle classes who may require it, the amplest means for restoration or alleviation in sickness, including not only the best medical and other attendance, but baths, suites of rooms kept at a uniform temperature, and other appliances beyond the reach even of the comparatively opulent in private dwelling-houses. The advantages of such an institution to professional and commercial men, and all whose avocations lead them to live chiefly in chambers or lodgings, are very obvious. It appears that they are capable of being realised at a very reasonable rate. By this institution, it is probable that many valuable lives may be prolonged, and much suffering avoided. Several meetings on the subject have been held, at which it was stated that the establishment could be put into operation, with about a hundred beds, at an expense of about 3000*l.* The estimated expense to each patient, it is reckoned, will never exceed two guineas per week. Subscriptions to a considerable amount have been already obtained, and the project is likely to be effectual. This is indeed only an extension of the plan of Medical Clubs, which have been adopted in many parts of the country by the labouring classes.

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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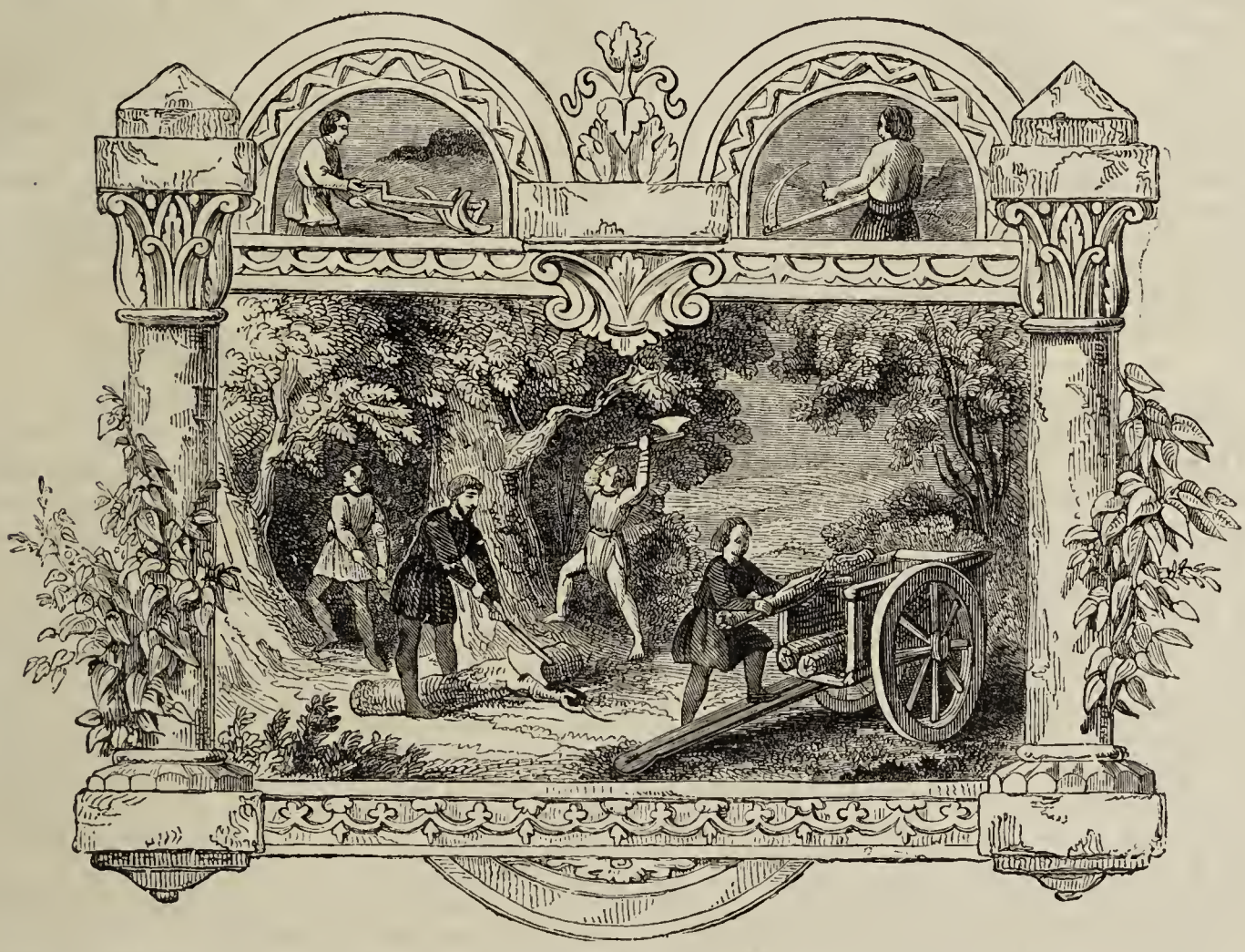
BRITISH AGRICULTURE.

JUNE.



[Saxon Agricultural Emblems of June.—The central compartment from Cotton MS, Claudius, B. 5; the smaller ones and the border from Arundel MSS., 381 and 383.]

Though the keeping of bees may not, strictly speaking, come within the range of any general system of agriculture, yet since it has always been considered among those matters that appertain to a rural life, and the month of June being among the most interesting seasons to the keepers of bees, we may, without materially departing from our professed purpose, introduce a few remarks upon this interesting subject. We are told that when the poet Virgil undertook his poem of the 'Georgics,' at the solicitation of the prime minister of Augustus Cæsar, it was with the design of restoring its proper dignity to the art of husbandry, and promoting an inquiry into its principles, which, mainly through the anarchy of the times, had been greatly neglected in Italy. We mention this in order to show the importance of the subject of bees at that early period of history in the delightful climate of Italy, since out of the four parts or books into which the poem is divided, an entire book is devoted to the subject of bees. But we need not travel abroad, nor to times so remote as that alluded to, to find the subject considered of sufficient importance to attract the attention not only of poets, but of many enlightened prose writers; for we have had several original works and treatises upon bees and bee-keeping published in this country, as well as translations from the writings of foreign authors of considerable distinction.

Although bees and bee-keeping are commonly considered as confined to rural districts and occupations, we often see one or more hives—sometimes a considerable number—attached to the habitations of individuals whose pursuits are unconnected with lands or agriculture; for the village tradesman and artisan are often among the most fortunate of bee-keepers. Cottagers too we occasionally find possessed of a hive or two of bees. Generally speaking there is but little expense attached to keeping them; for unless the swarms are so small and late that it is not worth the attempt to winter them, or in seasons that happen to be peculiarly unfavourable for their storing up a supply for the winter, they require scarcely any expense or care; the former consisting of a new hive for each swarm, and the latter of a little looking after about the season of their swarming.

In ordinary seasons they seldom cast their swarms before the beginning of June; though, should the weather prove warm during May, with gentle showers and gleams of sunshine, this event will sometimes occur earlier; for Tusser, in his 'May's Husbandry,' says—

> "Take heed to thy bees that are ready to swarm,
> The loss thereof now is a crown's worth of harm;
> Let skilful be ready, and diligence seen,
> Lest being too careless, thou losest thy been."

There is an old proverb, as ancient as the days of

Tusser, which says, in alluding to bees, "A swarm in May is worth a load of hay," which would seem a rather high value in our time for a swarm of bees. But in Tusser's time it would be nearer the mark, if a swarm were worth a crown, for the value of money has altered so much since then, that what was estimated at a crown would be worth at present eight times as much, or about two pounds sterling, which sum, in countries where single-horse carts are in use, would be at present somewhere near the value of a load of hay. Some farmers, and even such as farm pretty extensively, make bee-keeping an object both of interest and emolument; for having made themselves acquainted with the habits and peculiarities of these interesting insects, they not only find a pleasure and an amusement in attending to them, but at the same time manage to turn their knowledge to a good account. For this purpose they erect bee-houses in the most favourable situations, bestow upon them the little attention they may require, sow and plant some such grasses or vegetable crops as yield blossoms that they delight in quite close at hand, in order that when the weather is boisterous or unsettled, they need not have far to travel in seeking for their honey. Shade-trees are also provided to shelter the hives from the scorching rays of the meridian summer sun, as well as from the pitiless storm :—

"First for the bees a settled station find,
A sheltered spot, where ne'er intrudes the wind;
For when to feed the puny insects roam,
A storm may drive them from the sweets of home."*

A country wholly arable is to bees a complete desert; for among the ordinary crops of grain (now that buckwheat is but little in use), and we may add vegetables, there is scarcely a blossom from which they can extract as much honey as would subsist them during the summer, much less enable them to provide a store against the winter. Pliny, Columella, Celsus, and sundry others among the ancient writers upon agricultural and rural affairs, devoted much of their attention to bees and bee-keeping; but in the earlier ages, and particularly in the warmer latitudes of those countries bordering upon the Mediterranean, if we may judge from the general interest with which those industrious little insects seem to have been regarded, the advantages of bee-keeping, one might naturally conclude, must have been much greater then than at present, or than they have ever been amongst ourselves. When malt and spirituous liquors were not so generally in use as they have been now for a long period, more honey was used in making mead, not only among the farming community, but among nearly all ranks and classes, for there was scarcely a family that did not keep some of this beverage by them—the more wealthy to bring to table with wines and other liquors—the poorer classes to administer as a medicine in sundry complaints and maladies, and to drink a little with some particular friends and acquaintances on some rare or festive occasion. At present it is comparatively little drank; there are particular districts of country, principally in the west of England, where the more ancient part of the householders annually make a certain quantity of mead, as the past generations had been accustomed.

Our space will not permit us to pursue the subject of bees to any great extent; but it is somewhat curious to observe that the whimsical (not to call it by the harsher terms superstitious or absurd) custom of making a tinkling noise to attract the attention and stay the flight of a newly east off swarm, in most of the rural districts is still rigidly adhered to. In some parts of the country a brass or metal pan, struck by the kitchen tongs, is considered as producing the magical sound; in other places a pewter platter is struck by the key of the hall or house door, producing, as the old women imagine, the bee-seducing music; while elsewhere we have seen an anxious matron pursuing an unsettled family of these wayward insects, beating with all her might upon that domestic implement the frying-pan with a clumsy iron-headed ladle. Even during Virgil's time this tinkling seems to have been generally practised, as also the custom of rubbing the interior of the new hives with certain bruised herbs :—

"Here the bruised balm and common woodbine use,
And sprinkle timely the directed juice;
And tinkling cymbals of Cybele ring.
They'll to the medicated places cling,
Themselves unforced to inmost shades retire."*

As summer may fairly be considered as commencing with June, though this present year we experienced the temperature of Midsummer during the month of April, among the farming classes the summer customs (where they differ at all from the winter ones) are now about commencing. But the customs to which we allude are, and ever were, rather local than national; for a reference is here principally made to the daily work and diet of the farm-servant or labourer; and except in a few by no means extensive districts, we believe the difference in the mode of living, and of working too, between the summer and winter seasons is much less at present than it formerly was :

"From May to mid-August an hour or two,
Let Patch sleep a snatch, howsoever ye do:
Though sleeping an hour refresheth his song,
Yet trust not Hai Grouthead for sleeping too long."†

From all we have been able to arrive at respecting this custom of sleeping after dinner, it seems to have been pretty general during the summer months some centuries ago; but at present it is but in a few places that we find any rest or sleep allowed in the middle of the day to the farm-servant, however laborious his occupation may happen to be. Even in those districts where the custom the longest prevailed, we find it now limited to the season of hay-making; and even then those only who are engaged in mowing the grass are privileged to an hour's sleep or rest after dinner. During the corn-harvest similar customs once prevailed, so long as most of the hands employed in the harvest-field were members of the farmer's family,—his sons and daughters, or the hired domestics that lived in the house. But now, when comparatively but few of those engaged in hay or harvest time belong to the farmer's establishment or household—the ties which once bound servant to master and master to servant no longer existing—throughout the toil of a long summer's day there is no relaxation for the hired labourer, save a spare allowanee for him to eat his humble crust in. As regards the manner of living, it varies greatly between one part of the country and another; but, upon the whole, since comparatively few farm-servants have been maintained and lodged in the farm-houses, those that still are kept are by no means fed so well as they formerly were. In some places during the summer months an additional meal, or lunch as it is called, is allowed to those who are engaged in particular sorts of work; and the eustoms differ so much between one section of a country and another, that we sometimes find the wages varying two or three pounds per annum, where precisely the same sort of labour is to be performed, the servants being willing to submit to lower wages where their diet is so much superior. For instance, there are local districts where, during the winter season, the men and boys never rise until after six o'clock; before eight they sit down to a comfortable breakfast of bread and milk, either heated and made into pottage, or cold, with an unlimited quantity of bread, butter, and cheese. At ten o'clock a pint of home-brewed beer, of a tolerable quality, with an allowance of bread and cheese, is always provided; while two hours afterwards they sit down to a hot dinner. At

* 'Georgics,' book iv.

* 'Georgics,' book iv. † Tusser, 'June's Husbandry.'

four in the afternoon a counterpart of their forenoon's allowance is brought to them, whether in the barn or in the field, and about seven in the evening they sit down to supper, which scarcely, if at all, differs from the morning meal. But in the neighbouring districts, where the wages are somewhat higher, more work is performed, and that with but three meals in the day; and it is only during the season of hay-making and harvest-time that any indulgence in the way of diet is allowed. Then, however, we probably shall find the mowers regaling themselves with strong beer, and bread, butter, and cheese, before they leave the premises in the morning; while at something before eight o'clock a breakfast superior to what they partake of at other seasons is provided; at ten a quart of strong beer or ale, with bread, butter, and cheese, is the usual allowance; and a good dinner follows soon after twelve. In the afternoon, at four o'clock, a similar allowance to the forenoon's lunch is provided; and when the labour of the day is over, a good supper awaits them. With this liberal allowance of meat and drink, during the sultry summer noon, those engaged in the more laborious duties of mowing, beneath the cool shade of some spreading tree, every day after dinner indulge for an hour or more, and might exclaim with the poet,—

"Sweet idlesse, when the earth is gay,
Kissed by the bridegroom sun of June,
On some green slope to dream away
The still and languid hour of noon;
While golden bees a drowsy tune
Are murmuring in the heath-flower's bells,
In joy for summer's honeyed boon;
And seas are whispering on the shells:
And the fond cushat softly grieves,
Hid in the forest's rustling leaves."*

But as we remarked in a late number, home-brewed ale and beer, or even brewery drink, as that is often denominated which is manufactured at a common brewery, is now but little partaken of by the great mass of farm-servants; and except during harvest-time, in most of our leading agricultural districts, it is no longer brought to the field or the table. Where farmers keep a stock of malt liquor on hand, for the consumption of themselves, their friends, and their guests, there is occasionally a little small-beer to be seen in the kitchen, but that only happens at certain periods of the year, and is of so poor a quality that it is not considered of much account.

In the cider counties, when the apple crops are abundant, most of the working people are allowed a little at their ordinary daily labour; whereas in seasons of scarcity they are obliged to go without it; nor do the farmers supply them with beer in its place, or any other substitute. The household bread that we find placed before farming domestics differs materially between one part of the country and another, both in kind and quality. In a majority of instances, however, we now find wheaten-bread, of a middling quality, consumed among the agricultural population. This not only applies to most of the midland counties, but likewise to most of the southern part of the island; though in some places, and particularly in the west of England, a very coarse black bread, made of inferior undressed wheat, is in pretty general use. In Lancashire, Westmoreland, and portions of several of the adjoining counties, oaten-bread is chiefly consumed by the labouring people (and this applies to many parts of Scotland), and in Northumberland, Durham, and portions of Cumberland and Yorkshire, rye is still used for bread in many families; but the meal of peas and beans, which formerly was employed to mix with that of rye or wheat, can hardly be said to be in use any longer. Barley-meal, or flour, is still less used than rye, and except among some of the mountainous districts, where little grain of any sort is raised, we seldom now meet with barley in the shape of household bread. But even where the inferior sorts of grain are still in use on ordinary occasions, the wheaten cake or loaf may often be seen, even at the cottager's tea-table, and daily at the tables of such as are of ability to procure it.

* J. R. Chorley

It is now nearly a century ago that drill-husbandry was introduced into various parts of the country; and owing to the great advantages that were found to result from it, it has extended to nearly every part of the kingdom, excepting the secluded valleys in the mountain districts, and those situations where the plough is never allowed to disturb the virgin soil. It was neither the saving in the quantity of seed employed, nor the greater regularity of committing it to the ground, though both of them of importance to the farmer, that established the popularity of the drill; for the more enlightened agriculturists were not slow in discovering its chief merit, namely, that of enabling them to keep their lands, during the period the crops occupy the soil, perfectly clear of all weeds, a matter of the first consideration with good farmers. In one of our Supplemental Numbers we touched upon the wonderful change that had been effected by the introduction of the drill, and we have here reverted to it again in order to show its importance as connected with the cultivation of turnips. Last month we stated that May was the best season for sowing Swedish turnips; but that the present month is the more usual season for putting in the seed of the common turnip crops. Of these there are several varieties, since in shape we find them round, flat, oblong, and long; while in colour they vary still more, for among the sorts in general use we find white, yellow, purple, green, and red ones. The quality, too, differs materially; since some are less watery and much more nutritious than others; and some are hardier, and therefore stand through the winter tolerably well, which is frequently a matter of much consequence to the farmer. Generally speaking, before the introduction of drill-husbandry, turnips had been cultivated to but a limited extent; as a common crop, looking to no future advantage, they were on the whole far from a profitable one; for in order to succeed with them a considerable expense in labour and manure was necessary, and what lessened their value was, that scarcely any of the kinds then known among farmers were able to stand through severe or variable winters, a point that has since been achieved, and found of the greatest benefit to the agricultural interest. Even at the present day, a crop of turnips that repays all the expenses bestowed upon it, the rent of the land included, may be considered little (if at all) beneath an average crop. But then there are other considerations with the farmer who adopts a regular system of turnip husbandry, for the crop not only affords him a supply of succulent and nutritious food for his farm-stock during the winter and early part of the spring, but, besides assisting and maintaining the stock, it enables him to get rid of a portion thereof, if such is his object, in a condition to supply the butcher's stall. Besides, by the operation of hand and horse hoeing during the preceding summer, the weeds are totally eradicated; and if, during the winter and spring, the crop is fed off upon the ground, the soil when the season advances is in the best possible condition for the reception of barley or other grain. When the turnips are consumed early in the season, a crop of wheat may be put in with every prospect of success; for there are two excellent reasons for expecting a good crop, namely, the absence of all weeds and rubbish, and the fertile condition of the soil, partly produced by the preparation for the turnip-crop, and partly by the turnips being consumed upon the ground by farm-stock; and particularly so where they are eaten off by sheep.

Norfolk was among the first extensive agricultural districts that introduced the turnip culture upon an extensive scale; but the benefits were found to be so various and extensive, that many other counties in the south, the

west, and the north, were induced to follow the example. All soils are not, however, adapted for the successful cultivation of the turnip, for where the land is wet, cold, and clayey, it is rarely that even a moderate crop of turnips is raised. Loamy soils, and those inclining to sand, with the assistance of manure commonly produce good crops of turnips. Before the introduction of bone manure, which has been found peculiarly adapted to the cultivation of turnip crops, decayed stable manure, and composts, of which lime formed a part, were generally used. When the ground has been thoroughly prepared, that is, completely cleared of all grasses, weeds, roots, and rubbish, and reduced to a fine tilth, it is then ploughed into narrow ridges of from twenty to thirty inches wide, and if stable-dung or compost is used, the manure is then carted upon the ground, and carefully deposited along the furrows. The ridges are then split with a double mould-board plough, by which means new ridges are formed where the original furrows were, and consequently directly over the manure, so that when the drill has deposited the seed along these new ridges, the plants enjoy the full benefit arising from the manure being directly below. But when bone-dust is employed there is no necessity for the ridges being formed a second time, for in the same narrow track that the drill makes for the seed the manure is scattered, so that the seed on vegetating comes into immediate communication with this fertilising substance; a roller, which follows the drill, completes the operation.

It is unnecessary to enter upon the details of what attention the crop may require afterwards, which will in some measure depend upon the quality and cleanness of the soil, the character of the weather, &c.; but in general cases the young plants ought to be twice hand-hoed, and the earth stirred between them as often, with a horse-hoe, a plough, or a scuffler, as the case may seem to require. The turnip-fly (as the small insect is called which so commonly preys upon the plants while very young) is probably more dreaded by the arable farmer than any other insect or reptile with which crops are occasionally infested; for it is by no means an uncommon occurrence with the farmer to find his whole crop of young turnip-plants (which, a few days previous, had looked healthy and promising) destroyed by these ravenous little depredators; and this often occurs not only once, but after the trouble and expense of re-sowing, it will often happen again and again. Various means have from time to time been recommended to prevent the ravages of the turnip-fly; but although some of them on a limited scale, or under peculiar circumstances, may have proved beneficial, the individual would bestow an immense boon upon the agricultural interest who should discover or invent a never-failing means of preserving the young plants from those minute destroyers. The most sure way for the crop to escape destruction is a rapid growth after the plants first appear, for as soon as they throw out their rough or second pairs of leaves, the fly ceases to prey upon them. This, however, greatly depends upon the state of the weather; for should there be a succession of hot dry days after the plants first show themselves, neither the application of soot, snuff, nor any of the various other preparations that have been recommended, will be found a safeguard against these small insects. Perhaps burning weeds or stubble along the windward side of the field, where it is not very large, may often be found to answer a better purpose than most other attempts at saving the young plants.

In those parts of the country where turnips are extensively cultivated, the cleaning of the turnips and turnip-lands affords employment to many labourers at a season of the year when labour, were it not for these crops, would be comparatively scarce; and when once lands are set apart for turnip crops, they must be carefully attended to, for when these crops are poor, or totally fail, the evil is not confined to that season (as is the case with most other crops), but operates unfavourably upon the crops that are to follow, until the rotation (commonly of three or four years) again comes round. A modern writer* thus expresses himself respecting the value of a good crop of turnips:—"If we succeed in getting a good crop of them, we may calculate on all the other crops of the course being good also. Nothing puts land in better order than a large crop of turnips; and on this crop depend entirely our prospects of future profit. We are, therefore, very anxious to prepare for this crop, get all the dung for it we can, and spare no expense in cleansing, hoeing, and *doing it well*.

"With this root we can cultivate with advantage those thin light dry soils which, before its introduction, lay in a state of nature. The food which it produces for sheep enables the farmer to keep a much greater number of them; and the additional quantity of manure which is thus produced on a farm, where such an article cannot be purchased, is incalculable. The sheep are now kept on turnips during the winter and spring months, as well, if not better than they are in the summer: and are fattened through that period of the year in which it used to be difficult to keep them alive."

As we may not again particularly refer to this subject, we will extend our remarks a little further upon this interesting part of arable farming. The cultivation of the German beet (mangel-wurzel), carrots, and cabbages, are all sometimes adopted as substitutes for the turnip crop; but inasmuch as, after repeated trials with all of them, none of them are cultivated to anything approaching the extent to which turnips are, the superior advantages attached to the cultivation of the latter seem to have been clearly established. To such of our readers as possess but few opportunities of acquiring a knowledge of agricultural affairs, and know but little regarding the source from whence our meat-markets are principally supplied, it may not prove uninteresting to learn that during the greater portion of winter, and most generally until late in the spring of the year, the larger supplies of beef and mutton (and veal too, since turnips are the chief producers of milk during the winter season) which find their way to most of the principal markets connected with our large towns and cities, are almost wholly dependent upon our turnip crops. Agreeably to the views and intentions of the farmer respecting the stock upon his farm, so is the supply of turnips administered in greater or smaller quantities; those termed lean or store cattle having but a few turnips given to them along with their straw in the farm-yard; while the milch cows, and the cattle intended to be fattened, are supplied in a most liberal manner. Care is sometimes necessary in order not to satiate them (soon after the cattle are put up to feed) with this species of food, for it will happen that an ox or a heifer, after eating voraciously of turnips for a little while, will become so glutted with them as to refuse them altogether. Where, however, a very rapid fattening process is considered desirable, oil-cake (made from compressed rape or flax seed) is given, along with a liberal allowance of turnips; and frequently a little meal is found to make an agreeable addition or change to the food. Sheep, as well as cattle, are greatly dependent upon the turnip crop; and now that our population has so much increased beyond what it was a century ago, and consequently the consumption of butcher's meat, it would be next to impossible for our farmers and graziers to supply our markets during the winter and spring months with such excellent beef, mutton, and veal as they do at present, without the aid of turnip husbandry.

In the agricultural districts, among the necessary buildings we now commonly find attached to a farm, a turnip-house is seldom wanting. In this building, during the winter, a stock of turnips is always kept on hand, for

* Mr. J. Morton.

the weather might be such as to render it impossible to draw the turnips in the field, and hence, without a stock being kept on hand, a great inconvenience might sometimes arise. They are often pulled and carted to the cattle, and thrown upon the green sward in some dry part of a meadow; but in the generality of cases when fed to sheep, the sheep are penned upon them on the ground where they grow, the fat sheep remaining so long as to consume the tops and best part of the roots, when they are removed to a fresh lot of turnips, and the store sheep follow to consume what had been left soiled and uneaten. It is thus that the ground is so materially benefited by sheep being allowed to eat off the turnip crops; for besides the trampling of their feet, the land is enriched by their dung and urine to a much greater extent than many persons would imagine. When the crops fail in the early part of the season, and the summer becomes so far advanced before the plants take, that the crop cannot attain to maturity, the plants are suffered to grow much thicker upon the ground than it is customary to permit them; when, during the winter, the greater part is drawn and given to the farm-stock, a portion of the plants being left in the ground for the purpose of throwing out seed-stalks early in the spring, by which means an early supply of green food is procured for the ewes and lambs, or such other stock as may require it. The quantity of turnips produced upon an acre will sometimes average from forty to fifty tons.

In those parts of the island where large flocks of mountain-sheep are kept, June is the month when the sheep-washings commonly take place; whereas in many of the southern and midland counties both the washing and shearing take place during the month of May. It is quite clear that the sheep are shorn earlier in the season than was the case formerly. In some cases early shearing is desirable; for if the weather continue warm after the sheep have been shorn, there can be no objection to it, for they will be decidedly more comfortable, and will thrive better without the burden of their woolly fleeces. But should the cold weather return after the sheep are shorn, which it sometimes does at a late period, particularly in Scotland and the north of England, the wool is better upon the sheep's backs until the weather sets in decidedly warm. Even at the present day there seems no settled opinion respecting the period that ought to elapse between the sheep being washed and shorn: in some places it is customary to wait a couple of weeks after washing; in other parts of the country only the same number of days; while some persons insist that as soon as the fleece is dry it ought to be taken off the sheep's back. Tusser says—

> "Wash sheep (for the better) where water doth run,
> And let him go cleanly, and dry in the sun;
> Then shear him, and spare not, at two days an end,
> The sooner the better, his crops will amend.
>
> Reward not thy sheep when ye take off his coat,
> With twitches and patches as broad as a groat;
> Let not such ungentleness happen to thine,
> Lest fly with her gentils do make it to pine."*

The "twitches" and "patches" here alluded to are wounds made in the skin of the sheep by the unskilful or negligent shearer. When it was more the custom than it now is for the extensive sheep farmers to have their flocks shorn in a single day—when all the neighbours, farmers, and mechanics attended by invitation to assist in the sheep-shearing, the occasion was looked upon in the light of a frolic or holiday, rather than as an occasion of labour or toil.† As a matter of course, plenty of good cheer was provided; and although dinner was not prepared until the shearing was over, during the time that it was progressing there was generally an abundance of ale or strong beer brought to the ground, which every one partook of who wished to indulge, even to inebriation in some instances. These potent and deep draughts might incite the parties to greater exertion, but the poor sheep were often the sufferers, for so reckless became those engaged in stripping them of their fleeces, wounds even of a dangerous nature were inflicted; and although they might pass undiscovered at the time, for want of proper care and attention afterwards, they frequently cost the sheep their lives. Those not acquainted with the process of shearing sheep can hardly form an idea of the celerity with which the operation is performed; for a small mountain-breed wether, whose fleece is open, the wool being coarse and long, may be shorn of his coat by a middling performer in less than five minutes. The track of the shears on sheep of this description is commonly lengthwise, that is from head to tail, inclining, however, a little obliquely; whereas in most parts of the country where the larger and finer-wooled sheep are kept, the shear-marks show that their track has been directly across the back. We may now annually see shorn (or naked, as they are called) sheep brought to Smithfield market so early in the season, that to strip them of their warm coats while the spring, much less summer, can scarcely be said to have commenced, is very cruel; but this, like many other acts of cruelty towards the brute creation, is done for the purpose of obtaining a trifle more profit by one or other of the parties concerned, altogether reckless, apparently, of the pains and sufferings of the poor dumb animals. One thing, however, may be stated in extenuation of so barbarous a practice (if a greater degree of cruelty can be considered any excuse for a less), for we have several writers upon ancient modes and customs, who inform us that in some countries, and even in some parts of our own, at one period clipping or shearing off the fleeces was dispensed with; for it was the custom to tear the wool from the back and sides of their sheep, breaking the fibre, or plucking it up by the roots, about the season of the year when the fleece becomes partially detached from the skin; and yet they called this operation sheep-shearing.

Another of the early and rude modes of obtaining the fleeces of the flock was that of driving or pushing the sheep through some peculiarly narrow passage; and by repeating this a few times, the fleeces became so completely loosened from the skin, that they almost dropped off themselves from the backs that had produced them. It has been asserted that in some of the islands of Scotland, particularly those of Orkney, that the custom prevailed of pulling the wool from the sheep's backs, which, however, we hope is now no longer practised; though Mr. Law, in his 'Fauna Oreadensis,' says, "About Midsummer there is a particular day published for *rowing*, when all the men in the parish attend with their dogs, turn out and drive the whole flock, without any preparation of washing, into narrow pens, and from thence (I may say) to the place of execution, where the wool is torn off their backs; an operation which brings their blood into their skin, and is not only disgusting, but if the season proves harsh, is the cause of great destruction. But however cruel it may seem, it is almost the only notice that is taken of these useful animals by their unfeeling masters until that time twelvemonth."

In treating upon this subject we have made some observations upon the cruel practice of taking off the fleece while the weather still continues cold. It is true that when sheep become exceedingly fat their fleeces are a a great incumbrance, and even though the weather should be cold, they would continue to thrive better provided their excessively warm coats were exchanged for lighter ones. In Greece and some other countries such great attention was wont to be bestowed upon the flocks of sheep, that they were accommodated by having their fleeces removed from their backs early in the season, but were provided with a sort of garment or covering made of cloth, and thus not subjected instantaneously to so great

* 'June's Husbandry.' † 'Penny Mag.,' Nos. 459 and 482.

a change. Even in our own time, in the mountain-ranges of our own island, we remember seeing many an old ewe, or lean 'gimmer,' pasturing on the hill sides with an old woollen garment, or part of an old blanket, sewed round their bodies; for although the mountain-sheep, are scarcely even shorn *before* Midsummer, it generally happens in a flock of several hundreds, or perhaps thousands, that some few belonging to the classes above mentioned are in such poor condition, that if not permitted to retain their fleeces a little longer, by being shorn become so perfectly denuded of covering, that if the owner does not take the trouble to give them an artificial coat for a short period, the chances are that some of them will perish from the effects of the cold.

As one of the principal points in good farming is keeping the soil clear from weeds and all such plants as impoverish the ground or injure the quality of the crops—and as the present month may be considered the latest period for weeding and destroying the noxious productions of the soil, we will proceed to offer a few remarks regarding the ordinary sorts of weeds that infest lands in general; and cannot forbear expressing it as our decided opinion, that notwithstanding the various improvements that have been introduced into our code of agriculture in most parts of the country, even where farming has attained a fair reputation, the extirpation of weeds is still less regarded and attended to than the importance of the subject deserves. Weeds, in all sorts of crops, lessen the quantity, and in grain crops the quality too, whether intended for seed or used for ordinary domestic purposes.

"In May get a weed-hook, a crotch, and a glove,
And weed out such weeds as the corn does not love.
For weeding of winter corn now is the best,
But June is the better for weeding the rest.

The May-weed doth burn, and the thistle doth fret;
The fitches pull downward both rye and the wheat;
The brake and the cockle be noisome too much;
Yet like unto boodle no weed there is such."*

Amongst weeds, as amongst plants in general, there are many annuals—such as come to perfection in one year, bear seed, and die; and perennials, or those that continue alive an indefinite number of years. Some of the latter are propagated by seed only, but others either by the seed or the roots. Among farmers, as well as horticulturists, weeds are commonly divided into two classes—those propagated by seed, and those propagated by the root. In crops of grain, pulse, &c., weeds, by mingling their seeds with the crops, not only deteriorate their quality, but also rob the soil of a portion of the nourishment intended for the crops themselves, and frequently occupy so much space as greatly to encroach upon that originally intended for the useful plants to occupy. Some persons will argue, who from their agricultural experience ought to know better, that crops of corn, under almost any circumstances, have room sufficient to grow in; and that it is the want of nourishment alone that prevents the plants from succeeding so well when sown or planted thicker than usual. But this is by no means the case, for allow a piece of ground to become infested with weeds that do not grow tall enough to interfere with the ears and upper parts of the corn-stalks, and yet the plants will be found to be slender, lean, and unproductive; being destitute, in a great measure, of those offshoots or collateral branches without which we never find a full and productive crop of corn, although the soil should be of the richest quality.

Since nearly all weeds (for there are a few that wind themselves around other plants and draw their nourishment from them) are fed and supported upon the same food that would nourish useful plants, it must be obvious that when weeds are permitted to grow among them, they will be robbed of a portion of the food that should have been theirs. And although it has been ascertained that the food of all sorts of plants is not precisely of the same kind; yet, generally speaking, such plants as we commonly find growing in the same soil by the side of each other, may be considered as subsisting upon the same description of food or nourishment. Weeds, nevertheless, that are found growing in the same soil, are exceedingly different in their natures; for whereas the seeds of some will decay and putrify in a year or two, if deposited in a moist soil and prevented from vegetating by the air being excluded from them, there are others whose seed will remain many years in similar situations, without having the vegetative principle injured or destroyed. This being the case, when arable lands become infested with weeds of certain sorts, the farmer often finds it the best plan to let them rest for a few years; by which means, if the weeds were of the first sort spoken of, they will be entirely eradicated. On the other hand it sometimes happens that grass-lands become so infested with useless or noxious plants, all such being properly termed weeds, that the best or perhaps only way of effecting a thorough destruction of them is that of subjecting the soil to a few years' tillage, which, however, upon old grass farms, agriculturists are often loath to resort to. It might have been mentioned, that lands overrun with couch-grass and other root-weeds of the same class, by being laid down to grass for half-a-dozen years, will be found completely freed from them, for on examination it will be found that their roots have been completely decomposed and destroyed. But the precise length of time necessary for the thorough destruction of root-weeds very much depends upon the nature of the soil; a hard and dry soil being a great deal more in the farmer's favour for effecting his purpose, than a moist, soft, and spongy one. It may be remarked, however, that it is not always convenient to change the character even of a small portion of a small farm which is decidedly either an arable or a grass one; and hence the evil of permitting the soil to continue infested with weeds from year to year is frequently submitted to.

It must not invariably, however, be considered as a decided proof of bad management, the appearance of certain weeds in the crops of the farmer, unless at periods of the year when a careful vigilance should have kept them under some sort of subjection; for the theory of vegetation is so truly wonderful, that notwithstanding the great enlightenment of the present age, among the generality of the farming community it is still but very imperfectly understood. Some sorts of soils seem to be peculiarly prone to the production of certain plants and weeds, to an extent that they are considered by many to be indigenous thereto. Much also depends upon the nature of the seasons; for frost or open winters, and wet or dry summers, have a great effect in increasing or diminishing several kinds of weeds during the ensuing year. Moreover, the most careful and best managing farmer often has the mortification to discover, that along with the manure that he finds it necessary to procure from a distance, he introduces a variety of weeds into his future crops, that otherwise would have been perfectly clean. The manures here alluded to are mostly the product of stables or the sweepings of the streets; for there are some sorts that are found to be great destroyers of certain weeds which some soils are commonly infested with. Thus, for instance, lime, when laid upon waste common or moor lands, will frequently be found not only to destroy many of the weeds or useless plants, but in a few years their places will be found occupied by a nutritious and excellent herbage. An instance of this sort may be mentioned which came under our own observation many years ago. An act of parliament having been granted for enclosing a common, most part of which was high and mountainous, an allotment of twenty acres was the part assigned to a small upland farm thereunto adjoining. At the time of the enclosure this allotment was

* Tusser's 'May's Husbandry.'

considered of so indifferent a quality as scarcely to be worth the expense of a stout fence of stone (stone being very abundant), but which was, however, in due time built. Shortly afterwards falling into the hands of an enterprising individual, he determined upon trying the effect of draining and liming; but in the first place he divided the allotment into five fields of four acres each, and upon one of these he commenced operations forthwith. The soil was mostly cold and spongy, and resting upon a hard and compact gravelly clay for a subsoil; but in some parts there was a depth of two or three feet of peat-earth, and that rested upon a stiff blue clay. The moory parts produced little but rushes, with two or three varieties of mosses, a few cranberry plants, and some other trifling and worthless productions; the greater portion of the rest yielded a little bent-grass, a species of dwarf rush, a little wild sorrel, and some stunted heath or ling: the whole lying on a slope inclining to the south-east. Stone being near at hand, covered drains were made sufficiently close to each other to lay the whole intermediate spaces dry; and, excepting within about six inches of the top, the drains were filled with stones, so that a considerable quantity of soil and subsoil remained, and was spread roughly over the intermediate spaces between the drains; upon which lime, in liberal quantities, was immediately applied. Sometimes this article, in an unslacked state, was made into a compost with rotten peat-soil from a neighbouring bog; and after the whole had been well mixed together, it was spread pretty abundantly over the entire surface of the ground. One or other of these modes was invariably adopted, both of which, on the whole, were very successful; the ling and rushes were, however, the more speedily subdued by the unslacked lime. The effect of this treatment was truly wonderful, for in the course of five or six years the twenty acres thus reclaimed were fully as productive as the very best old meadow-land belonging to any of the best farms in the neighbourhood. Without ever introducing a plough upon the premises, or sowing any grass-seeds whatever, the nature and quality of the produce became entirely changed; for in the place of rushes, bents, mosses, ling, &c., in a few years the herbage consisted of a mixture of red and white trefoil, narrow-leaved plantain, cocksfoot, burnet, sweet-scented vernal grass, and many other grasses valuable both for pasturage and hay. As above stated, the work of regeneration seemed nearly completed by draining and afterwards a liberal top-dressing of lime; but in order to make the improvement permanent, suitable buildings for farm-stock were erected in one of the five fields, and the produce afterwards being consumed upon the land, the manure thus yearly collected was applied to such portions of the ground as seemed the most to require a little occasional renovating.

Since the period that the land here alluded to was first reclaimed (now more than thirty years ago), without any extra labour or attention it has continued to yield excellent crops, both as regards quantity and quality. Now here is an instance of the destruction of various worthless productions of the soil, and in their places the spontaneous appearance of many valuable grasses, such as had, it is reasonable to suppose, never been known to grow upon the lands contained within the limits of the allotment, nor upon any of the surrounding lands immediately adjoining. This is but one of many instances that we have known of grasses appearing in soils where they had been neither sown nor planted. In this case the draining and liming had the effect of destroying the plants originally found in the ground; but this does not account for the more useful ones appearing in their places.

When the seasons prove favourable, the skilful farmer is commonly able to subdue most sorts of weeds by a succession of ploughings and harrowings; for where they are annuals, and grow only from seed, by exposing as much of the soil as possible, from time to time, to the action of the atmosphere, the seed thus brought near to the surface will be caused to vegetate; when by allowing the young plants to grow for a short time, and then ploughing them under, all the seed that vegetated is thus completely destroyed; and this process being repeated from time to time, the whole of the seed deposited in the soil is brought into contact with the atmospheric air, and in the above manner destroyed. But there are others, particularly among the perennial class of weeds, that all the ploughings which it is possible to give to a piece of ground would not effectually eradicate; so that when the soil, through mismanagement or some other cause, becomes infested with them, they have either to be hand-weeded, or carefully raked or gathered out when the soil is finely pulverised, or else the land has to be sowed with grass-seed and allowed to remain unmolested until the roots of those weeds decay and are thus got completely rid of.

> "At midsummer, down with the brambles and brakes,
> And after, abroad, with thy forks and thy rakes;
> Set mowers a-mowing, where meadow is grown,
> The longer now standing, the worse to be mown."*

Before closing our remarks upon weeds and weeding, which we propose doing by giving a short account of a few of the worst sort that infest the farmers' crops, we will observe, with regard to setting "mowers a-mowing," the day nor the month ought to be the guide for commencing the hay-harvest, but the fitness of the crops and the state of the weather; and since July, take the kingdom throughout, may be looked upon as the grand season for hay-making,—we will defer our remarks upon this head.

Among the numerous weeds infesting arable lands, we will enumerate a few which may be considered among the most pernicious to the interests of the agriculturist; but since the same weeds are not common to every part of the country, persons whose practical knowledge is confined to particular local districts cannot be supposed to be familiar with them all. Cockle (or darnel-grass, as it called in some places) is a plant so detested, and so generally known among our corn-crops, particularly those of wheat, that a description of the plant would be deemed superfluous. Its seeds are large and black, and heavy too, and hence not easily separated from the grain; but which is exceedingly necessary to be done, for if ground with the wheat, a very small quantity of these black seeds impart a bad colour to a considerable quantity of flour. The machines employed in winnowing and dressing corn are greatly superior to what they formerly were; and it would seem that in seasons when the crops were infested with certain weeds (cockle being one) and diseased ears, that not being able to separate them from the corn used in domestic purposes, the health of the inhabitants was believed to become infected; the following old distich is still familiar among the rural inhabitants of some of the northern counties:—

> "When cockle 's mixed in wheaten corn, and spurred is the rye,
> Though some that year there will be born, more in their graves will lie."

Annual darnel-grass, commonly called white darnel, and, in some of the southern counties, carp, besides being known by other local names, has ever been considered among the greatest pests of corn-crops; but the ridiculous notion that it was produced from bad seed-wheat is now generally exploded. When used in either bread or beer, it used formerly to be believed that it caused feelings near akin to drunkenness; and, even at the present day, it is considered bad for the eyes, and sometimes believed to produce vertigoes. It is an annual whose seeds ripen at the time the corn does among which it grows; so that where plants of it have been permitted to grow up with the crops, some of the seed is usually shed, and this lays the foundation of future injury.

* Tusser, 'June's Husbandry.'

Colts-foot, or foal-foot, is a very common weed, principally infesting light gravelly soils, and is very difficult to extirpate. It propagates its species both by its seed and long running roots, every piece of which, when cut by the plough, or torn asunder by the harrow, will produce a new plant; so that in order to get rid of it completely the land requires to be well and carefully dressed, for every piece of the roots of this plant has to be gathered and burned, or otherwise destroyed. The plants while young may be pulled up by the hand. The plants of this weed increase so rapidly, and take such complete possession of the soil, that they greatly impoverish any crop of grain among which they grow.

Charlock, or, as it is sometimes called, chadlock or cadlock, or wild rape or wild mustard, is among those worst of plants that are known to infest crops of grain, particularly oats and barley. There are but few farmers who have not, at one time or other, had the mortification to find whole fields, of otherwise promising crops of corn, quite yellow with an unexpected growth of charlock, completely overtopping the young grain. The term unexpected is used because this is one of those peculiar weeds the seeds of which will remain dormant in the soil for a long term of years, the seed being of so oily a nature that it does not decay; so that when by-lands are ploughed up, or a deeper furrow exposes new soil, in which the seed has formerly been deposited, to the action of the air, the farmer is annoyed by finding his crops, during the latter part of May, assume more the appearance of rape or mustard than either oats or barley. The plants of this pernicious weed are frequently so numerous that it would be impossible to weed them out without destroying the crop of grain. Some farmers, therefore, when the charlock is in blossom (which is before the corn spindles up for earing) skin over the whole field with the scythe, cutting off the principal part of the blossoms of the charlock without seriously injuring the corn; but as many plants will still mature and shed their seed, much cannot be said in favour of this plan. When the plants are very young they so much resemble those of turnips, that it is difficult to know the one from the other. It is nearly impossible, by fallowing or laying down the land to grass, to destroy this pernicious weed when once it has got possession of the soil.

There are several other weeds that more or less infest corn-crops, which we have not room to describe; the names of a few of the worst are as follows:—bearded oat-grass, or wild-oats; bastard alkanet, sometimes called gromill, gromwell, or falfern; dodder, which principally subsists on the juices of other plants, to which it attaches itself; corn-parsley; lesser hemlock, or thin-leaved wild hemlock; knot-grass, swine's-grass, or bird's-tongue; black bind-weed; corn crow-foot; yellow vetches; corn-poppies and marygolds; viper's bugloss; cow-parsnips; common couch-grass; common field scabious; bladder campion; great knap-weed, or bull-weed; with two or three varieties of the nettle, and several sorts of thistles. How similar are the pests of the corn-crops of the present day to what they were in the time when a classic poet thus refers to them,—

"New labours soon are added to the grain,
Lest blight consuming through the stems should reign,
And thistles sluggish prickle o'er the ground:
Down sinks the corn; a wood now bristles round,
Caltrops and burs; and through the shining crop
The gloomy darnel and wild-oats o'ertop."*

* Virgil, 'Georgics,' book i.

MONTHLY CALENDAR.—JULY—Seventh Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock bef. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h. m.		h. m.	h. m.
1 W	183	. . .	3 49	3 29	8 18	1·9	5m 47	9a57
2 Th	184	. . .	3 50	3 40	8 17	2·9	7 17	10 15
3 F	185	Dog-days begin.	3 50	3 51	8 17	3·9	8 42	10 29
4 S	186	. . .	3 51	4 2	8 17	4·9	10 3	10 41
5 *Su*	187	3 *Sunday after Trinity.*	3 52	4 13	8 16	5·9	11 20	10 52
6 M	188	Old Midsummer Day.	3 53	4 23	8 16	☽	0a34	11 4
7 Tu	189	{ Thomas à Becket. Oxf.Act.&Camb.Com.	3 54	4 33	8 15	7·9	1 48	11 18
8 W	190	. . .	3 55	4 42	8 14	8·9	3 2	11 34
9 Th	191	. . .	3 56	4 51	8 14	9·9	5 15	11 56
10 F	192	Camb. East. Term ends.	3 57	5 0	8 13	10·9	5 26	morn.
11 S	193	Oxf. Trinity Term ends.	3 58	5 8	8 12	11·9	6 30	0 25
12 *Su*	194	4 *Sunday after Trinity.*	3 59	5 15	8 11	12·9	7 23	1 5
13 M	195	. .	4 0	5 23	8 10	13·9	8 4	1 58
14 Tu	196	. . .	4 1	5 29	8 9	○	8 35	3 3
15 W	197	St. Swithin.	4 2	5 36	8 8	15·9	8 57	4 16
16 Th	198	. . .	4 3	5 41	8 7	16·9	9 14	5 32
17 F	199	. . .	4 4	5 47	8 6	17·9	9 28	6 48
18 S	200	. . .	4 6	5 51	8 5	18·9	9 40	8 5
19 *Su*	201	5 *Sunday after Trinity.*	4 7	5 55	8 4	19·9	9 51	9 22
20 M	202	. . .	4 8	5 59	8 3	20·9	10 3	10 39
21 Tu	203	. . .	4 10	6 2	8 2	21·9	10 18	11 59
22 W	204	. . .	4 11	6 5	8 0	☾	10 36	1a24
23 Th	205	. . .	4 12	6 7	7 59	23·9	11 1	2 51
24 F	206	. . .	4 14	6 8	7 58	24·9	11 38	4 19
25 S	207	*St. James.*	4 15	6 9	7 56	25·9	morn.	5 39
26 *Su*	208	6 *Sunday after Trinity.*	4 16	6 10	7 55	26·9	0 31	6 42
27 M	209	. . .	4 18	6 9	7 54	27·9	1 45	7 27
28 Tu	210	. . .	4 19	6 9	7 52	●	3 13	7 57
29 W	211	. . .	4 21	6 7	7 51	0·6	4 45	8 18
30 Th	212	. . .	4 22	6 5	7 49	1·6	6 13	8 34
31 F	213	. . .	4 24	6 2	7 47	2·6	7 38	8 47

Meteorological Averages.

Barometer.	Ins.
Mean height	29·874
Highest	30·300
Lowest	29·390
Hygrometer.	°
Mean dew-point	54·5
Highest	67
Lowest	41
Mean dryness	6·5
Mean greatest do. of day	13·7
Greatest dryness	20
Thermometer.	
Mean temperature	61
Highest	76
Lowest	42
Radiation.	
Mean great. of Sun	25·8
Greatest power	60
Mean cold of terrest.	3·6
Greatest ditto	13
	Ins.
Mean qty. of rain	2·516
Mean of evap.	3 293

Table of the Winds.

	Days.	Dew-P.
N.	2½	50°
N.E.	3	49
E.	2	50·5
S.E.	4	58
S.	2¼	58·5
S.W.	7	59
W.	5	56
N.W.	5¼	53

SUNDAY LESSONS.

July		Morning.			Evening.	
5	3 aft.	Trin. 1	Sam. 2	Luke 17	July 5 1 Samuel	3..Colos. 1
12	4	„	„ 12	„ 24	12 „	13..1 Thes. 4
19	5	„	„ 15	John 7	19 „	17..1 Tim. 4
26	6	„	2 Sam. 12	„ 14	26 2 Sam.	19..Titus 1

THE MOON'S CHANGES.

First Quart. 6th day, 2h.4m. aft.
Full . . . 14th day, 5h.31m. aft.
Last Quart. 22nd day, 6h.46m mn.
New . . . 28th day, 9h.28m. aft.

Day of Mth.	Length of Day.	Day's decrease	Day breuk.	Twil. ends.	Sun's Semi-di.
	h. m	h. m.	No real Night.		
1	16 29	0 5			15′ 45″
6	16 23	0 11			15 45
11	16 14	0 20			15 45
16	16 4	0 30			15 46
21	15 52	0 42			15 46
26	15 39	0 55			15 46

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BASING HOUSE.

[Basing House after the siege.]

THE small village of old Basing, near Basingstoke in Hampshire, has been distinguished from an early period of our history, as the scene of a severe battle fought in 871 between the Danes and the Saxons, when the latter, under the command of Alfred and his brother King Ethelred, were defeated; and in later times it has become no less memorable for the gallant defence of Basing House, the principal subject of our present paper.

There appears to have been a castle here at a very remote period, for in a grant made to the priory of Monks' Sherbourne, in the reign of Henry II., mention is made of the "old castle of Basing." This appears to have been rebuilt in a magnificent manner by Paulet, the first Marquis of Winchester, a nobleman in some degree remarkable for his skill in courtiership: he lived during four reigns, those of Henry VIII., Edward VI., Queen Mary, and Queen Elizabeth, and enjoyed the royal favour in all. We may add, that he himself is said to have explained the secret—the "being a willow and not an oak." We have said that he rebuilt Basing House in a magnificent manner: according to Camden, it was rendered *so* magnificent and costly as to be "overpowered by its own weight;" the expenses of living it entailed upon the owner were so great, that the builder's posterity were forced to pull down some part of it. In this splendid mansion the Marquis had the gratification of receiving Elizabeth in 1560, and of entertaining her in so royal a manner that she playfully lamented his great age, remarking, "By my troth, if my lord treasurer were but a young man, I could find in my heart to love him for a husband before any man in England." The queen came here again in 1601, and was entertained by the fourth Marquis for "thirteen dayes," and, as we are told and can very well believe, "to the greate charge of the sayde Lorde Marquesse," for during her visit Elizabeth received in state the French ambassador, the duke of Biron, who was accompanied with about twenty other French noblemen, and a retinue of some four hundred persons. It is recorded that the Queen made this circumstance a matter of gratulation, saying "she had done that in Hampshire that none of her ancestors ever did, neither that any prince in Christendom could do; that was, she had, in her progresses, in her subjects' houses, entertained a royal ambassador, and had *royally entertained him.*" We have now to speak of the gallant defence of Basing House during the civil war, by John, the fifth Marquis.

In August, 1643, Basing House, then very strongly fortified by the Marquis for the king, was invested by the parliamentary troops, and, for a period of two years, broken however by occasional intermissions, was continually harassed by the enemy. During this time many assaults were made, particularly by Sir William Waller, who, within nine days, three times attempted to carry the house, but was repelled with great loss, and ultimately obliged to retreat. On their part, too, the besieged troops kept the besiegers in a constant state of anxiety and alarms by repeated sallies. After Waller's defeat the parliamentary forces of Hampshire and Sussex were collected under Colonel Norton, who once more summoned the Marquis to surrender. The answer was, "If the king had no more ground in England than Basing House, he would maintain it to the uttermost." Famine

now promised to accomplish for the parliament what its soldiers could not; the distress of the garrison became so great, that in September, 1644, the Marquis, after having in vain sent messenger after messenger to Charles, who was at Oxford, for relief, was compelled to send a last notice that in ten days he must surrender if no assistance were given. For the time, however, the brave defenders of Basing House were saved by the courage and address of Colonel Gage, who, seeing their desperate condition, volunteered to convey them provisions. He succeeded in accomplishing this object, and in returning to Oxford with the loss of eleven men killed and forty or fifty wounded. This protracted defence would naturally draw the eyes of the nation upon the struggle, and make it imperative upon the parliamentarians to succeed. Accordingly the attack was next confided to the man who knew not defeat; Cromwell appeared before it, and the fate of the place was sealed. His force consisted of three regiments of foot and three regiments of horse; the garrison, according to Sir Robert Peake (its governor, under the marquis), of three hundred fighting men, but according to his antagonists of about five hundred. The house was also defended by about ten pieces of ordnance. The result is best told in Cromwell's own brief business-like letter to the Speaker of the House of Commons, dated 14th October, 1645:—

"Sir—I thank God I can give you a good account of Basing. After our batteries placed, we settled the several posts for the storm: Col. Dalbeere was to be on the north side of the house next the grange, Col. Pickering on his left hand, and Sir Hardresse Waller's and Col. Montague's regiments next him. We stormed this morning after six of the clock: the signal for falling on was the firing from our cannon, which being done, our men fell on with great resolution and cheerfulness. We took the two houses without any considerable loss to ourselves. Col. Pickering stormed the new house, passed through and got the gate of the old house, whereupon they summoned a parley, which our men would not hear. In the mean time Col. Montague's and Sir Hardresse Waller's regiments assaulted the strongest work, where the enemy kept his court of guard, which, with great resolution, they recovered, beating the enemy from a whole culverin and from that work; which having done, they drew their ladders after them, got over another work and the house wall before they could enter. In this, Sir Hardresse Waller, performing his duty with honour and diligence, was shot in the arm, but not dangerously. We have had little loss: many of the enemies our men put to the sword, and some officers of quality; most of the rest we have prisoners, amongst which are the Marquis and Sir Robert Peake, with divers other officers, whom I have ordered to be sent up to you. We have taken about ten pieces of ordnance, much ammunition, and our soldiers *a good encouragement*," &c. The booty, thus delicately phrased, was indeed considerable, being valued at 200,000*l*. It consisted of money, jewels, provisions, the magnificent furniture, and, in a word, the entire contents of Basing House. The provisions and furniture were sold to the country-people. What the soldiers left a fire destroyed, caused by the neglect of the garrison in quenching a fire-ball thrown by the besiegers. In less than twenty hours, Basing House literally presented nothing but bare walls and chimneys. The prisoners were about two hundred in number, and the slain about one hundred: of these there were counted in the house immediately after the assault seventy-four men and one woman, a young lady, the daughter of Dr. Griffith, whose fate is very pitiable: "she came," says Mr. Peters, Cromwell's messenger to the parliament, "railing against our soldiers for their rough carriage towards her father," whom he acknowledges they used hardly, on account of his opinions and past conduct. Her two sisters, and six or seven other ladies of rank, appear to have been permitted to escape without any serious injury. The Marquis himself would in all probability have fallen a victim to the rage of the soldiers but for an incident of a nature which it is especially gratifying to meet with in such transactions. The week before, Col. Hammond, the parliamentary officer, had been taken prisoner by the Marquis: when the assault of the house was evidently successful, and all hope leaving the besieged, they began to hide themselves where they could from the fury of their enemies: the Colonel was relieved from his imprisonment just in time to be the means of saving the Marquis's life, according to a promise, but at the immediate hazard of his own. Many of the garrison probably escaped, and others miserably perished in the vaults of the house. Mr. Peters says, "Riding to the house on Tuesday night, we heard divers crying in vaults for quarter; but our men could neither come to them nor they to us."

In the concluding portion of the letter from which we have before quoted, Cromwell recommends the destruction of Basing House, and the parliament concurred in his recommendation. From a survey made of the spot in 1798, it appears that the area of the works, including gardens and entrenchments, occupied about 14½ acres. The form of the fortifications was very irregular, surrounded with very deep ditches and strong and high ramparts; the existing remains were peculiarly bold and striking. The citadel was circular, having an oblong square platform on the north, defended by a rampart and covered-way. The north gateway was still standing, together with parts of the outward wall, constructed of brick, joined with great care and nicety. The site of the ruins is bold and commanding. The Basingstoke Canal now runs through it.

The Marquis lived long enough to taste the bitterness of ingratitude: the Restoration came, but brought him no recompense for his immense losses; the exertions, the anxieties, the gallantry, and the fortitude which entitle the Marquis to our respect and admiration, produced no acknowledgment, at least no fitting or worthy one, from the son of the man for whom so much was done and suffered.

SKETCHES OF THE COASTS FROM SINCAPORE TO PEKIN.

II.—From Camboja to Hainan.

[Continued from No. 528.]

The lake from which the great river Camboja flows is said to be in the centre of Tibet, and to be environed with high mountains, at the foot whereof, upon the brink of the water, are thirty-eight villages, inhabited by gold-miners and searchers for diamonds, with both which precious commodities the bowels of the earth teem in those inland regions. Such are the relations made to travellers; whether founded or not on truth we are unable to say. Even the kingdom of Laos, which lies about a third of the distance from the sea, is one of the most obscure in all Asia, and it seems probable that, although these reports are founded on facts, as the information must pass through many hands ere it reach the shore, much fiction is necessarily blended with it.

Be the accounts, however, true or false, certain it is that the river falls by several mouths into the sea at the distance of one hundred miles from the point of Camboja. On the eastern bank begins the kingdom of Tsiompa, which extends about one hundred and fifty miles along the shore, but its breadth is only ninety. It is inhabited by two races of people, the Loyes and the Moyes; the former a large muscular and well-formed tribe, with reddish complexions, slightly flattened noses, and long black hair. A shirt and trowsers, with a kind of petticoat, occasionally fringed with silk, form their costume.

The productions of their country offer a striking contrast with those of Camboja. Although merely separated by a river, their only remarkable productions are a little cotton, indigo, and inferior silk. Like many other nations

whose country is not exceedingly fertile, they excel in naval affairs, their junks being comparatively well-built. They have extensive fisheries, indeed fish is their principal article of export, together with a little gold and Columba-wood, carried away by the Chinese to burn on their altars, in exchange for which they bring tea, porcelain, and other commodities. The Moyes are a kind of slaves who inhabit the mountains, and have no other covering than a cloth which they wrap around their middle. The government of the king, who holds his petty court at Feneri, is very oppressive, and some crime is always sure to be brought home to whoever is guilty of showing any superior degree of riches.

The whole of the coast is exceedingly picturesque, and is overgrown with jungle and forest. Several islands stud the sea, and numerous little promontories project into the waves. At the eastern extremity Cape Padaran rears its bold front, and all the waters from thence backward to the great river swarm continually with boats of every description, some stationary, engaged in fishing, others passing to and from Europe, Java, Sumatra, Siam, Camboja, Cochin-China, Tonquin, Hainan, and the various ports of China, all issuing from or making towards the narrow passage left between the Paracel shoals and the coast. This passage runs direct north for nearly four hundred miles, when the sea becomes again free and the ships take a straight course to Hainan.

The Paracel shoals are the most famous in all these seas, they being like an overflowed continent, lying just beneath the surface of the water. At the northern extremity there is a group of small reefs, called the Triangles, and the dangerous Macclesfield shoals. If any vessels chance to go aground here, they run a double danger, for, besides the heavy swell, they have another enemy in the marauding Cochin-Chinese, who sail up and down looking out for such windfalls, falling upon and plundering the wreck without mercy.

The kingdom of Cochin-China politically includes a great part of Camboja and the whole of Tonquin, extending as far northward as the Chinese province of Yunnan. It does not enter into our plan to attempt a minute description of the interior, a rapid glance along the coast being all that is necessary to complete the picture of the lands that fall under the traveller's observation in the voyage to China from Sincapore. Not that there is nothing curious in the nature of the country, or the manners of the people; on the contrary, so extraordinary are they, that they would require a long article of themselves to give any adequate idea to the reader. Here the river inundations pour down over all the land from the mountains to the sea. Far back in the inaccessible crags and forests dwell the Kimoyes, a wild and untameable people, something akin to the Moyes, who inhabit the wilderness of Tsiompa; the elephant, the rhinoceros, the wild boar, and the tiger roam over the heights, making frequent incursions into the intervening valleys, destroying the husbandman, bearing away his cattle, and trampling on his harvests. The forests abound with rose-wood, iron-wood, sapan-wood, Columba-wood (for a piece of which, large enough to form a pillow, the Japanese will give four hundred ducats a pound), ebony, calembour, the cinnamon tree, together with all the other varieties which render India so rich, yielding precious gums, balm, and other perfumes; fruits also are plentiful, and though the common vegetables of Europe refuse to yield seed, yet yams, sweet potatoes, green pumpkins, and melons are plenteous in the market-places, which, besides all these provisions, are lined with sheds made of bamboo, and full of cloth and other articles of native manufacture. Narrow paths divide the fields from each other. Buffaloes, for the horses though mettlesome are small, drag the wooden ploughs; children pick the cotton from the pod, the women spin and weave it. In fact, the people themselves are brave, active, and industrious, more warlike than most of their neighbours, expert gunners, but unskilful in casting cannon and other fire-arms. They are said to have a great respect for truth, are extremely ignorant, but affect great politeness towards each other, as well as towards strangers. The civil officers, however, and the soldiers, treat the people like dogs, and for the usual reasons—they are beaten by their superiors, and, like children at play, they ease their own shoulders by passing the blows round through the whole population.

Let us now resume our coasting voyage. Leaving the tower-like rock of Cape Varela, and the broad bay called Quin-nong behind us, we come at length to Touran harbour, which is very capacious and has good holding-ground for ships. The air is cooled and refreshed by alternate land and sea breezes, which blow continually. The hills around are low and covered with bushes, interspersed with little rude altars, erected by the fishermen who frequent this bay, on which to offer rice and sugar or burn odoriferous woods, as a propitiation or thanks giving to their deities for expected or past successes in their daily avocations. At the southern extremity of the harbour, flowing out between low sandy shores, the resort of the pelican of the wilderness, is a river called, as well as the town, by the Portuguese, Faifo, and upon a neighbouring point of land a curious watch-tower or scaffolding, where a native is continually on the look-out for inward-bound ships. The green fields on either hand slope down towards the river, in which may be seen the children of the adjacent hamlets, from the age of two years, swimming and sporting as though in their native element. Touran town itself presents a delightful prospect; the houses are low, built chiefly with bamboo, and thatched with rice-straw or rushes. Here and there trees wave over them, whilst some are situated in gardens and groves of the areca-nut tree, the orange, the lime, or the plantain. The streets or lanes are filled with persons of both sexes, clothed in long-sleeved gowns reaching to the feet. Sometimes in the case of the women the garments are triple, of three different colours and lengths. The back is covered with a light boddice, and a thin veil is thrown over the head. No linen is worn, but instead of it, next to the skin, silk or cotton trowsers. The ladies wear a sash to support their purse or reticule, divided into three compartments, one for tobacco, one for the arcca-nut, and the third for the betel-leaf, all three of which they keep constantly in their mouths. Nor are the gentlemen less given to this enjoyment. They one and all throw over their shoulders an ornamented riband, at the end of which, instead of a sword, hangs a similar case to that in use among the ladies, and for the same purpose. Caps and turbans are sometimes worn, but shoes are rejected by the whole population, they having other uses to put their feet to than mere locomotion. In fact, the young men employ this member to play at shuttlecock, and every artisan brings it into play, but especially the boat-builders, whose toes are in constant activity whilst engaged in pegging, sewing, painting, weaving, and luting their fragile canoes. Sugar manufacturers also, iron-smelters, and woodcutters manage to take advantage of the extraordinary flexibility acquired by their feet in consequence of the total absence of covering. Now let us proceed along the shore to Hue, a town intersected with canals in order to keep it cool, and to afford frequent opportunities to the inhabitants of bathing, as well as for the more convenient transfer of merchandise. Every family keeps its covered boat, and it is a pleasant sight to see them glance along ploughing up the water with their carved and gilded heads, and painting the surrounding mirror with their own vivid colours.

We now quit this coast, leaving Tiger Island, South Watcher, and the Cochin-Chinese wall behind us, and stretch away for Hainan. The coast is bluff and rocky, but inland it soon sinks into level plains, whilst in the centre again rises a vast cluster of mountains. In these

dwell the remnant of the aborigines, who formerly traded with the Chinese inhabitants of the low countries in gold, with which the streams are said to abound. On the whole it is a barren country, producing little except timber, rice, and sugar, which latter they carry chiefly to the north of China. Their fisheries, however, are considerable, and thousands of junks come annually from Canton to fetch cargoes of dried and salted fish. Indeed along the whole coast of China the inhabitants are employed in fishing, and the places they frequent present a bright and curious *coup d'œil*, each boat having a lighted lamp on the stem, and moving slowly about amid the straits and islands. Here the fishermen dwell constantly with their families, retiring into the sheltered creeks on the approach of the typhoons, and waiting there the passing of the hurricane. These fisheries have been the nursery of all those pirates who have so frequently desolated the coast of China, from the time of Koshinga to that of the modern Ladrones, who flourished in the beginning of this century.

Beside the commerce we have above mentioned, Hainan trades also with several of the countries that lie between it and Java, in going to which latter the merchants cut timber on the coasts of Tsiompa and Camboja. On arriving at Bankok, they build and man several new junks, which, being laden with suitable cargoes, are brought back and sold at Canton or their native island. Rice also, and bones for manure, are among the imports of Hainan, and the *lapis armenus* (Armenian stone), used in colouring porcelain, is found there and carried in great quantities for that purpose to Canton.

The southern coast of China swarms with innumerable islands, our knowledge of which is daily increasing as our ships touch sometimes at one and sometimes at another for water and fuel. The principal are the Ladrones and Samchuen; the former so called from their having been the resort of the pirates above alluded to, and the latter remarkable as the place where St. Francis Xavier lived when he hoped to enter China, and was buried. This great apostle of the East possessed, in common with innumerable successors, an ardent desire to explore the hidden things of this vast empire; and the desire is natural. We love to study what nature seems to have delighted in rendering difficult of access; and where natural obstacles are increased by the inhospitable character of the natives whose country we would explore, our curiosity is still further excited. Thus with China. The enterprising spirit of European travellers has rendered the attempts at excluding them almost useless. Although frequently driven back, they have again and again returned to the charge; and at length have succeeded in obtaining a permanent footing on their coasts. What turn of events may hereafter occur to extend or diminish this intercourse it is impossible to foresee, but that some change in our relations with that empire is approaching must be evident to all.

ON MAGNESIA.

There are probably few persons who have not, at some period or other, had opportunities of experiencing the mild and beneficial qualities of magnesia, and who may not be interested in a brief description of its history, mode of preparation, and properties.

About the beginning of the eighteenth century, a Roman canon exposed for sale at Rome a white powder which he called *Magnesia alba*, or white magnesia, and stated that it would cure all diseases. He kept the method of preparing it profoundly secret; but in 1707 Valentini stated a method by which a similar powder could be prepared, and in 1709 Slevogt discovered another method. The properties of this powder were, however, so little known, that most chemists continued to regard it as nothing more than a preparation of lime; until the year 1755, when Dr. Black published some admirable experiments which explained its real nature.

Magnesia exists abundantly in nature: it is found in sea-water and in various mineral springs in union with sulphuric and muriatic acids. Its chief locality is in that class of rocks called magnesian limestone, where, as the name implies, it is in union with lime. Magnesia is also found in some minerals, and its presence may generally be detected by the touch,—a soapy feel pertaining to most of them: indeed, one of these minerals has, on that account, obtained the name of soap-stone.

An impure form of carbonate of magnesia is sometimes found native in Piedmont, Moravia, and the East Indies, in which latter place a whole range of low hills is said to consist of it. In the state of hydrate (that is, magnesia chemically combined with water) it occurs at Swinaness in Uist, one of the Shetland Isles; and also at Hoboken in New Jersey, where it is said to be very pure.

The reader is probably aware that a metal in union with oxygen is called a metallic oxide. Now it may excite some surprise when we state that calcined magnesia (as it is termed), a white, inodorous, and almost tasteless substance, is a metallic oxide; and that it is so is thus proved:—if oxygen be expelled from it, we then get a solid metallic substance very much like silver, called magnesium, which is considerably heavier than water, and which, if exposed to the atmosphere, absorbs oxygen, and is reconverted into magnesia.

There are two kinds of magnesia used in medicine: 1, common magnesia, which is a carbonate; and 2, calcined magnesia, which is the metallic oxide we have just mentioned. The process for obtaining the first kind of magnesia will be readily understood by the following easy experiment, which requires but little apparatus for its performance:—

Into a wine-glass put a small quantity of carbonate of soda, and into another wine-glass a rather less quantity of sulphate of magnesia (Epsom salts). Pour equal quantities of boiling water into the two glasses; and when the contents are dissolved, the solution will be quite clear and limpid. Pour the contents of one glass into the other, and the mixture will become turbid and opaque. The reason for this remarkable change is this: carbonic acid quits the soda and unites with the magnesia, forming carbonate of magnesia; at the same time sulphuric acid quits the magnesia and unites with the soda, forming sulphate of soda, which, being a very soluble salt, remains in solution; but the carbonate of magnesia, being insoluble, sinks to the bottom as the liquid cools. If the contents of the glass be allowed to cool, the solution of sulphate of soda can be poured off: pure cold water is then added, to wash the carbonate of magnesia: it is thrown upon a filter of blotting-paper, and more cold water is added, which passes through and leaves the carbonate of magnesia behind. If this latter be dried, it will be found to possess all the properties of common magnesia.

A plan somewhat similar to this is adopted in the preparation of common magnesia on the large scale, so that we need not repeat the description of the process. When the magnesia is washed and dried, it is made up into small parcels for the retail trade of the druggist.

We have said that carbonate of magnesia is insoluble. This is not strictly correct: it is however so little soluble as to require 2493 times its weight of cold and 9000 times its weight of boiling water for solution. This again is a very remarkable fact: we know that in almost all cases boiling water dissolves a far larger quantity of a soluble solid than cold water does:—the reverse is the case with magnesia and another substance, viz. lime.

Calcined magnesia is obtained in its purest form by exposing the carbonate of magnesia obtained in the first process to a strong red heat for a few hours: carbonic acid and moisture are expelled, and the magnesia is made

slightly caustic. Calcined magnesia requires 5760 times its weight of cold, and 36,000 times its weight of boiling water for solution. By exposure to the air it absorbs moisture and carbonic acid, and thus returns to the state of a carbonate.

Magnesia possesses most of the properties of alkalis: it forms neutral salts with acids, which salts are usually remarkable for their very bitter taste. Magnesia will bear a very intense heat without fusing.

The chief medical use of magnesia is, in doses of from one scruple to one drachm, to neutralize the acid of the stomach, and to act as a gentle aperient. Professor Brande says that "small doses of carbonated magnesia are also effectual in some cutaneous eruptions, especially in the pimples about the chin, nose, and forehead, which are symptomatic of acidity of the stomach." When magnesia is taken in large quantities, it has a tendency to lodge in the bowels and concrete, thus producing much inconvenience and often danger to the patient. In cases of acidity of the stomach and heartburn, calcined magnesia should be taken, because the acid of the stomach combines with the magnesia without effervescence; whereas if the carbonate be used, this effervescence is often very painful and inconvenient. The carbonate is chiefly used as an aperient.

AMMON, RABBAH, OR PHILADELPHIA.

[Ruins of the Mausoleum at Philadelphia.]

The ancient metropolitan city of the Ammonites, so often mentioned in the sacred writings under the name of Ammon or Rabbah, and whose present state so strikingly exhibits the fulfilment of the sacred prophecies, appears to have been rebuilt in the third century by Ptolemy Philadelphus, from whom it derived the name of Philadelphia. The oldest of the existing remains cannot be ascribed to a period earlier than this, whilst the others are evidently of a later date, and may be referred to the time of the Roman domination in Syria. After the destruction of the city, when or under what circumstances appears to be now unknown, its very situation during the lapse of centuries was forgotten. Its site was at length indicated by Seetzen, and various travellers have visited it since, and described the existing remains. Among these we may particularly mention Lord Lindsay and Mr. Buckingham. The former thus describes his approach:—

"The scenery waxed drearier and drearier as, at ten hours and a half from Jerash, we descended a precipitous stony slope into the Valley of Ammon, and crossed a beautiful stream,* bordered at intervals by strips of stunted grass, often interrupted; no oleanders cheered the eye with their rich blossoms; the hills on both sides were rocky and bare, and pierced with excavations and natural caves. Here, at a turning in the narrow valley, commence the antiquities of Ammon. It was situated on both sides the stream: the dreariness of its present aspect is quite indescribable—it looks like the abode of death: the valley stinks with dead camels; one of them was rotting in the stream, and although we saw none among the ruins, they were absolutely *covered* in every direction with their dung. That morning's ride would have convinced a sceptic; how runs the prophecy?—'I will make Rabbah a stable for camels, and the Ammonites for flocks; and ye shall know that I am the Lord!'

"Nothing but the croaking of frogs and screams of wild birds broke the silence, as we advanced up this valley of desolation. Passing on the left an unopened tomb (for the singularity in these regions is where the tomb has *not* been violated), several broken sarcophagi, and an aqueduct, in one spot full of human skulls, a bridge on the right, a ruin on the left, apparently the southern gate of the town, a high wall and lofty terrace, with one pillar still standing, the remains probably of a portico, we halted under the square building supposed by Seetzen to have been a mausoleum, and after a hasty glance at it, hurried up the glen in search of the principal ruins, which we found much more extensive and interesting than we expected, not certainly in such good preservation as those of Jerash, but designed on a much grander scale. Storks were perched in every direction on the tops of the different buildings; others soared at an immense height above us."

The valley in which these ruins stand is not above two hundred yards across, and is bounded on the north

* Called Moiet Ammon. It has its source in a pond a few hundred paces from the south-west end of the town, and after passing under ground several times, empties itself into the Zerka (Jabbok).

by a hill on which stands the remains of a fort, and on the south by a hill which is surmounted by a theatre. Through the valley runs a clear stream of excellent water, on each side of which are the remains of stately and beautiful edifices. The first building we shall notice as we move in a westward direction is of a square shape, with a Corinthian colonnade toward the stream, and presenting in the interior the appearance of an open amphitheatre. In the centre of what may have been the arena is a circular space full of ruined blocks, with a low arched opening at the southern extremity, intended perhaps for the passage of the beasts. Around this space rise upwards rows of stone seats intersected by smaller flights for the purpose of ascending or descending, of which, on the south side, two distinct divisions yet remain entire. Mr. Buckingham supposes that the amphitheatre was entered from above by flights of steps running up the exterior. The style of architecture is Corinthian, and the execution excellent. Very near to this building is a large theatre in extraordinary preservation, built in the natural hollow presented by the side of the hill. The front was originally open, for instead of a wall there extended a fine Corinthian colonnade, part of which yet remains. The pillars are about five feet in diameter, and the whole length of the colonnade was about one hundred and eighteen paces. The pavement of the stage is still perfect. The theatre is divided into three distinct portions, as if for distinct classes of persons; the whole comprising forty-five ranges of seats. A broad pathway runs round the whole at the top, in which there is at one part a recess with a fine Corinthian doorway, and concave niches on each side, intended probably for statues. The perpendicular height of the building is calculated by Mr. Buckingham at about one hundred and twenty feet, and the distance from the stage to the upper row of seats nearly two hundred feet. On the whole this edifice may be considered an unusually perfect monument of Roman luxury, for at a comparatively small expense it might be made available for its original purpose. Still following the course of the stream in a westward direction, we find on its opposite side the remains of a colonnade and the front of some large building, with steps descending to the water. Just above this edifice, on the side of the hill whereon the fort is built, are a number of arches, some of Roman and others apparently of Saracenic architecture. To the westward of these arches is a portion of a very large edifice, which looks like a temple, with some columns yet standing, and a part of the northern wall, with a doorway and various ornaments. At a part of the stream still farther westward, where the hill on which the theatre is built reaches close to it, there is a broad arch thrown over the water, the under part of which is smooth, but the upper rough and broken, as though some building had stood upon it. Crossing this bridge, we find a large edifice presenting its semicircular front to the stream, built of rustic masonry with solid stones of an oblong form closely united without cement. The southern front presents appearances of waterworks. In the interior of the building there was a colonnade standing round the inner part of the semicircular front we have mentioned. To the south-west of this building is a larger and more perfect one, with Roman arches and a square tower. The few buildings here noticed form but a small portion of the many interesting remains of this very interesting spot. We cannot better conclude our notice than in Lord Lindsay's words :—" Such are the relics of the ancient Ammon, or rather of Philadelphia, for no building there can boast of a prior date to that of the change of name. It was a bright cheerful morning, but still the valley is a very dreary spot, even when the sun shines brightest. Vultures were garbaging on a camel, as we slowly rode back through the glen, and reascended the *akiba* by which we entered it. Ammon is now quite deserted except by the Bedouins, who water their flocks at its little river. We met sheep and goats by thousands and camels by hundreds coming down to drink, all in beautiful condition. How—let me again cite the prophecy—how runs it? 'Ammon shall be a desolation!—Rabbah of the Ammonites . . . shall be a desolate heap!—I will make Rabbah a stable for camels, and the Ammonites a couching place for flocks; and ye shall know that I am the Lord!' "

HISTORY OF A MAHOGANY TABLE.—I.

In the first volume of the 'Penny Magazine,' p. 107, we gave a brief account of the mahogany-tree, of its mode of growth in South America, the twelvemonth's labours of a party of mahogany-cutters, and the final shipment of a load of mahogany in the form of square logs. We now profess to trace the progress of a log of mahogany till it assumes the familiar form of a table.

The quantity of mahogany imported into Great Britain amounts to ten or twelve thousand tons annually; and it pays an import duty varying from 1*l.* 10*s.* to 7*l.* 10*s.* per ton, according as it is brought from an English or a foreign colony. The price at which it is valued varies so extremely, according to the beauty of the wood, that it is difficult to determine the real value of a log. Dealers generally introduce an auger into a log of mahogany before purchasing it, in order to ascertain the quality of its grain, and to regulate the price thereby; but even then the quality and real value of the wood are matters of much uncertainty, so that the purchase is a kind of lottery. As the finest and most beautifully variegated mahogany is seldom used in logs or planks, but is cut up into very thin veneers, the quantity of surface of articles of furniture, &c. which can be covered by one log of mahogany is very large; so that when a log is sufficiently beautiful to be cut up into veneers, purchasers are willing to pay a very large price for it. It has been stated that a few years ago Messrs. Broadwood, the celebrated pianoforte manufacturers, gave the enormous sum of three thousand pounds for three logs of mahogany: these logs were the produce of one tree, and measured each about 15 feet long, 38 inches in diameter, and the same in thickness. They were afterwards cut into veneers of eight to the inch; and when laid on a groundwork, in the usual mode of veneering, were found to be susceptible of a most beautiful polish, offering a different figure when viewed in different directions, owing to the wavy or curled form of the fibres. It is not difficult to calculate that the veneers cut from these three logs would cover a surface of ground nearly three acres in extent. The reader will thence easily conceive that the value of a log of mahogany destined to be cut into veneers very far exceeds that of one which, from the inferior beauty of its fibres, is used in the solid state for legs of chairs and tables, &c.

A log of mahogany, as of any other wood, should be well seasoned before it is used: this seasoning does not imply that it should be exposed to heat to expel the moisture which still remains in it, but that it should be so placed as to be exposed to the action of the air for a considerable time. In the yards of the mahogany and timber dealers, the wood is generally exposed to the action of the air for a long period, both before and after the logs are cut up into planks or other thin portions.

Supposing a log to be ready for cutting, it must be sawn into thinner portions, whatever be the purpose to which it is to be applied. For all such purposes as the legs of tables and chairs, the posts of bedsteads, the bed of a table which is not to be veneered, &c., the log is cut up into planks varying from a quarter of an inch to several inches in thickness; but where it is to be in the form of veneers, it is reduced to a thickness varying from one-eighth to one-fifteenth of an inch. We will first speak of the cutting of the log into planks, for the legs, &c.

No other mode of dividing a log of wood into parallel

layers or planks has ever been devised equal to the use of a toothed cutting instrument, that is, a steel instrument which, like the saw, is jagged at the edge with triangular notches. Without attempting to decide who was the inventor of the saw, there is evidence existing that such an instrument was well known in early times. The ancient Egyptians used a short toothed saw, and among the antiquities found at Herculaneum is a picture, in which are two figures sawing through a piece of wood. There is a kind of work-bench consisting of a long table resting on two four-footed stools: the piece of wood to be sawn extends beyond the end of the bench, and is secured down upon it by cramps which pass through holes in the bench. The saw employed by the figures very much resembles a modern frame-saw: it consists of a square frame, having in the middle a blade, the teeth of which stand perpendicularly to the plane of the frame. It would thus reasonably appear that the frame-saw has been known for eighteen or twenty centuries.

But although saws have been used from a very early period, yet split or riven planks are used in many countries where the arts are in their infancy even in the present day. A wedge is driven into a cleft so as to tear or rive off planks or deals from a large log; and the inequalities necessarily resulting from this mode are then hewn away by some sharp instrument, such as an adze, so as to reduce the two surfaces to a tolerable degree of smoothness. So much waste of wood is occasioned by this mode of cutting the logs, that it is said Peter the Great of Russia, where it was generally adopted in his day, endeavoured to put a stop to it by prohibiting hewn deals to be transported to the river Neva. Since that period Russia has followed the example of other countries in using the saw for these operations. We may however here remark, that for some purposes hewn planks and laths are more useful than those produced by the saw, as being stronger: that they are stronger is occasioned by this circumstance,—when the timber is split by the wedge, the fissure follows the direction of the fibre of the wood, and leaves it whole; whereas the saw, which proceeds in the line marked out for it, divides or cuts the fibres, and by that means lessens the cohesion and strength of the wood.

The saw in its simple form is too well known to need description; but it is only that form of it used in cutting up large logs into planks with which we have here to do. The common mode by which this cutting is effected is as follows:—A pit, several feet deep, and of considerable length, has a hollow kind of framework built over it, and on this framework the log to be cut is laid. Chalk lines are then drawn along the log from one end to the other, and at intervals corresponding to the intended thickness of the planks. A saw with coarse teeth is employed to cut the log: it is six or seven feet long, and has a handle at each end. One man descends into the pit, and takes the lower handle, while another mounts on the log, and works the upper handle. The two men then, by a vertical action of the saw, cut the log from end to end, the "top sawyer" guiding the saw according to the chalk line, and receding as the saw advances. As only one cut can be made at a time, when that one is finished, the saw is removed to another chalk line, and a second cut made in a similar manner: these operations are repeated until the whole log is cut up into planks or pieces of various thicknesses. In some sawing-sheds the "bottom sawyer" stands at the level of the ground, and the other one, together with the log to be cut, is elevated on a stage or frame some feet from the ground.

Such was the mode of sawing adopted in most countries for many ages, and still is adopted in many parts of England, although a very severe exertion for human strength, and in some respects a singularly wasteful one, since the downward motion of the saw is alone effective in dividing the wood, the upward motion being no further useful than in preparing the saw to make a second cut. It is only in modern times that this inconvenience has been completely obviated by the general use of saw-mills. These mills appear to have been used to a considerable extent in Germany long before their introduction into England in the seventeenth century; but so violent was the opposition which the English sawyers raised against their use, that for many years all attempts to establish them permanently were unavailing. Even so late as the year 1767, an opulent timber-merchant caused a saw-mill driven by wind to be erected at Limehouse, under the direction of one James Hansfield, who had learned in Holland and Norway the art of managing machines of that kind: a mob of sawyers, however, assembled, and pulled the mill to pieces. But the advantages of these mills became soon so apparent, that they bore down all opposition, and their employment became very general. They were moved either by wind or water; but when steam-power was placed within the reach of manufacturers, saw-mills underwent a still more important improvement.

Without going into the minutiæ of construction, we may briefly describe the action of a saw-mill, such as is frequently used at the present day. A number of saws are fitted vertically into a frame, truly parallel one to another, and at distances of one, two, three, &c. inches, according as the log of mahogany or other timber is to be cut into planks one, two, or three, &c. inches in thickness. These saws are made immoveable in the frame, but the frame itself works up and down like the sash of a window. The log is laid horizontal, and one end of it brought up to the toothed edges of the row of saws. The frame containing the saws is then worked up and down, the saws all cutting simultaneously into the log; and as the latter is placed upon a bed or carriage sliding on the floor of the mill, and sufficiently narrow to pass through the opening in which the saw-frame slides up and down, it is pushed onward as fast as the saws cut, until the whole length of the log has been thus operated on. As the saws are ranged in a perfectly parallel manner, and as the log is moved onward with the greatest regularity, the cuts are made more truly than they could possibly be effected by hand, at the same time that several are being made at once instead of one. So much have the advantages of this mode been felt of late years, that almost every considerable timber-yard now contains a saw-mill.

The mill which we have just described is on the reciprocating principle, that is, the saws work alternately upward and downward; it therefore still retains the disadvantage, in common with hand-saws, of producing no effective working during the upward movement. This loss of power gave rise to the invention of circular saws, first introduced, we believe, by Mr. Brunel, about thirty-five years ago, and which are now extensively employed in sawing generally, and almost wholly for the cutting of veneers. The saws are mounted on a central axis, and the log is driven up against the toothed edge much in the same way as in the reciprocating saw-mill. A recent writer, speaking of the saw-mill of Messrs. Watson, at Battersea, erected by Mr. Brunel, says:—"Their apparatus is driven by steam, and consists of a number of circular saws, the largest of which is eighteen feet in diameter. One side of those saws is a plane kept perfectly true by a strong and well-bound framework, to the circumference of which the saw is attached. The teeth of the saw are rather large than otherwise, in order that it may not clog with the saw-dust, and thus tear the finer veneers; and it revolves with considerable velocity. The log of timber which is to be cut into veneers is fastened upon a frame, with the piece in the direction in which it is to be cut in a vertical position. The frame that carries forward the log is moved at a rate which may be varied according to the quality of the timber that is cut: it has a rack on the under part, in which a pinion works. In

cutting coarse stuffs, such as the soft and straight grained mahogany, of which the bottoms of drawers and other internal works of an inferior kind are made, the log moves forward, and the veneer is cut at the rate of about one foot of length in four seconds. Allowing the depth of the log to be two feet, the quantity of veneer taken off by one of these machines alone would be two hundred and forty square feet in an hour."* In this establishment the eighteenth-feet saw makes thirty-two revolutions per minute; while the smaller saws revolve much more rapidly: the larger saws and the slower motion are reserved for the finer and harder kind of wood.

Mr. Barlow describes a remarkable mode of cutting veneers, as adopted in Russia. The operation is begun by placing the log on a square axle, and turning it to a circular or cylindrical form while in rapid rotation. The blade of a plane of highly tempered steel, rather longer than the cylindrical log of wood, is fixed at the extremity of a frame six or seven feet long, in such a manner as to exert a constant pressure upon the cylinder, and pare off a sheet of equable thickness, which folds upon another cylinder like a roll of linen. The frame is so regulated as to depress the plane in proportion as the cylinder becomes pared away towards the centre. This machine is said to cut the most valuable woods without any waste, and with great rapidity; while the thinness to which the veneer is cut is so extraordinary, that it has been used for the covering of books, and other purposes where leather or paper are usually employed. The veneer thus produced is, in fact, nothing more nor less than a shaving, but one of which the thickness is uniform and equal. It is said that one hundred feet in length of veneer may be cut by this machine in three minutes.

These are the modes by which thin veneers are produced at the present day; and it may easily be judged how great are the advantages which they present over the original method (when veneers were cut by hand) in regularity of surface, in saving of material, in avoidance of fracture, and in saving of time. Formerly, in the absence of these advantages, a mahogany table, such as is now seen in almost every decent house, could not be procured but at such a price as placed it out of the reach of any but the wealthy.

Dogs of the Tschuktschi.—Of all the animals that live in the high north latitudes, none are so deserving of being noticed as the dog. The companion of man in all climates, from the islands of the South Sea, where he feeds on bananas, to the Polar Sea, where his food is fish, he here plays a part to which he is unaccustomed in more favoured regions. Necessity has taught the inhabitants of the northern countries to employ these comparatively weak animals in draught. On all the coasts of the Polar Sea, from the Obi to Behring's Straits, in Greenland, Kamtschatka, and in the Kurile Islands, the dogs are made to draw sledges loaded with persons and with goods, and for considerable journeys. The dogs have much resemblance to the wolf. They have long, pointed, projecting noses, sharp and upright ears, and a long bushy tail; some have smooth, and some have curly hair; their colour is various —black, brown, reddish-brown, white, and spotted. They vary also in size; but it is considered that a good sledge-dog should not be less than two feet seven and a half inches in height, and three feet three-quarters of an inch in length (English measure). Their barking is like the howling of a wolf. They pass their whole life in the open air: in summer they dig holes in the ground for coolness, or lie in the water to avoid the musquitoes; in winter they protect themselves by burrowing in the snow, and lie curled up, with their noses covered by their bushy tails. The female puppies are drowned, except enough to preserve the breed, the males alone being used in draught. Those born in winter enter on their training the following autumn, but are not used in long journeys until the third year. The feeding and training is a particular art, and much skill is required in driving and guiding them. The best-trained dogs are used as leaders, and as the quick and steady going of the team, usually of twelve dogs, and the safety of the traveller, depend on the sagacity and docility of the leader, no pains are spared in their education, so that they may always obey their master's voice, and not be tempted from their course when they come on the scent of game. This last is a point of great difficulty; sometimes the whole team, in such cases, will start off, and no endeavours on the part of the driver can stop them. On such occasions we have sometimes had to admire the cleverness with which the well-trained leader endeavours to turn the other dogs from their pursuit; if other devices fail, he will suddenly wheel round, and by barking, as if he had come on a new scent, try to induce the other dogs to follow him. In travelling across the wide tundra, in dark nights, or when the vast plain is veiled in impenetrable mist, or in storms or snow-tempests, when the traveller is in danger of missing the sheltering powarna, and of perishing in the snow, he will frequently owe his safety to a good leader; if the animal has ever been in this plain, and has stopped with his master at the powarna, he will be sure to bring the sledge to the place where the hut lies deeply buried in the snow; when arrived at it he will suddenly stop, and indicate significantly the spot where his master must dig. Nor are the dogs without their use in summer; they tow the boats up the rivers; and it is curious to observe how instantly they obey their master's voice, either in halting or in changing the bank of the river. On hearing his call they plunge into the water, draw the towing-line after them, and swim after the boat to the opposite shore; and, on reaching it, replace themselves in order, and wait the command to go on. Sometimes even those who have no horses will use the dogs in fowling excursions, to draw their light boats from one lake or river to another. In short, the dog is fully as useful and indispensable a domestic animal to the settled inhabitant of this country, as the tame rein-deer is to the nomade tribes. They regard it as such. We saw a remarkable instance of this during the terrible sickness which, in the year 1821, carried off the greater part of these useful animals. An unfortunate Juhakir family had only two dogs left out of twenty, and these were just born, and indeed still blind. The mother being dead, the wife of the Juhakir determined on nursing the two puppies with her own child rather than lose the last remains of their former wealth. She did so, and was rewarded for it, for her two nurslings lived, and became the parents of a new and vigorous race of dogs. In the year 1822, when most of the inhabitants had lost their dogs by the sickness, they were in a most melancholy condition; they had to draw home their own fuel; and both time and strength failed them in bringing home the fish which had been caught in distant places; moreover, whilst thus occupied, the season passed for fowling and fur-hunting; and a general and severe famine, in which numbers perished, was the consequence. Horses cannot be made a substitute; the severity of the climate and the shortness of the summer make it impossible to provide sufficient fodder; the light dog can also move quickly over the deep snow, in which the heavy horse would sink. Having thus described the out-of-door life and employments of the people of this district, let us accompany an individual into his habitation, at the close of summer, when he and his family rest from all these laborious efforts, and enjoy life after their manner. The walls are caulked afresh with moss, and new plastered with clay, and a solid mound of earth is heaped up on the outside as high as the windows. This is accomplished before December, when the long winter nights assemble the members of the family around the hearth. The light of the fire, and that of one or more train-oil lamps, are seen through the ice-windows; and from the low chimneys rise high columns of red smoke, with magnificent jets of sparks occasioned by the resinous nature of the wood. The dogs are outside, either on or burrowed in the snow. From time to time their howling interrupts the general silence; it is so loud as to be heard at great distances, and is repeated at intervals, usually of six or eight hours, except when the moon shines, when it is much more frequent.—*Expedition to the Polar Sea, by Admiral F. von Wrangell.*

* Library of Entertaining Knowledge, 'Timber Trees,' p. 171.

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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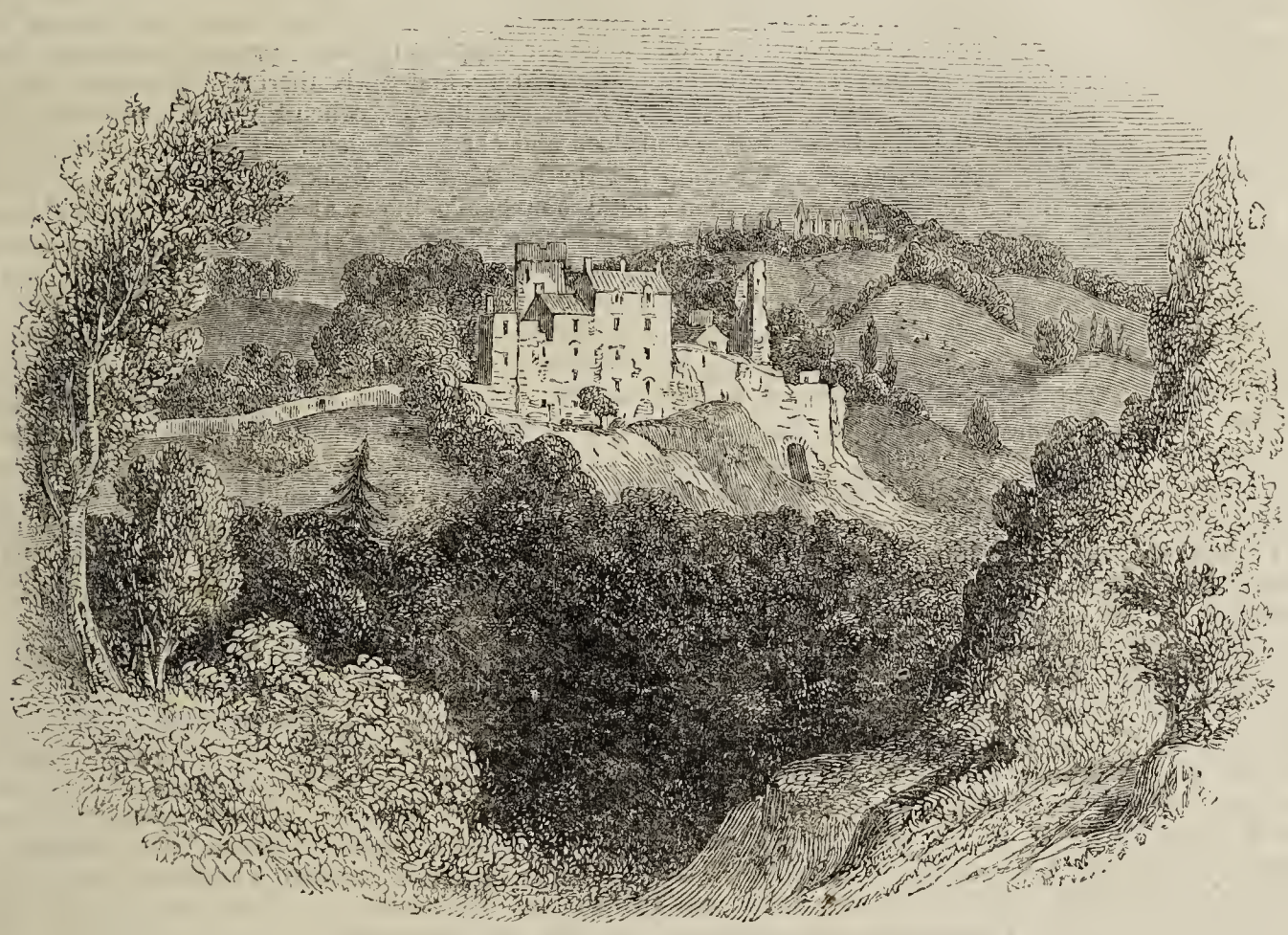
ROSLIN CASTLE.



[Ruins of Roslin Castle and Chapel.]

ROSLIN Castle is situated in the parish of Lasswade, about seven miles south of Edinburgh. It stands upon a lofty detached rock rising from a deep glen, and overhangs the river North Esk, which here makes a rapid turn and dashes foaming along over its rugged bed at the base of the hill. The scenery around is almost unequalled for its picturesque beauty and grandeur. Whilst on the one side the castle is defended by the Esk, which, winding among abrupt and towering precipices clothed with a most luxuriant vegetation, is itself in many parts inaccessible, on the other the plain is separated from the neighbouring country by the deep glen, which is also beautifully wooded, and over which the castle is approached by an ancient narrow stone bridge and through a gateway originally of great strength. The castle now consists of little else than a mass of ruined walls, in the centre of which a comparatively modern building has been erected, in a style, however, that harmonises with the older remains. Sir William Hamilton, who was concerned in the treasonable designs of the Earl of Douglas, was confined here in 1455. In 1544 the castle was burned by the English forces of Henry VIII., under the Earl of Hertford, and in 1650 it was surrendered to General Monk for the parliament. The founder of Roslin is supposed to have been William de St. Clair, who received a grant of the barony of Roslin from Malcolm Canmore, and whose father, Waldernus de St. Clair, came over with the Conqueror. This family gradually acquired immense power and distinction, styling themselves Earls of Caithness and Orkney, Dukes of Oldenburg, &c., &c. Many additions to the original edifice appear to have been made by William de St. Clair in the fifteenth century, who also built the famous chapel. This nobleman and his countess made Roslin a most imposing example of the feudal magnificence of the period. "He builded the church walls of Rosline, having rounds with fair chambers and galleries thereon. He builded also the forework that looks to the north-east. He builded the bridge under the castle and sundric office-houses. In the south-east side thereof, over against the chapell wall, he made plaine the rock on which the castle is builded for the more strength thereof, and he planted a very fair orchard. But his age creeping on him made him consider how he had spent his time past, and how to spend that which was to come. Therefore, to the end he might not seem altogether unthankfull to God for the benefices receaved from him, it came in his minde to build a house for God's service of most curious work, the which, that it might be done with greater glory and splendor, he caused artificers to be brought from other regions and forraigne kingdomes, and causd dayly to be abundance of all kinde of workemen present, as masons, carpenters, smiths, borrowmen, and quarriers, with others. The fundation of this rare worke he causd to be laid in the year of our Lord 1446, and to the end the worke might be more rare, first he causd the draughts [or designs] to be drawn upon Eastland boards, and made the carpenters to carve them according to the draughts thereon,

and then gave them for patterns to the masons, that they might therby cut the like in stone: and because he thought the masoncs had not a convenient place to lodge in near the place where he builded this curious colledge (for the towne then stood half a mile from the place where it now stands, to wit, at Bilsdone burne), therfor he made them build the towne of Rosline that is now extant, and gave every one of them a house and lands answerable therunto. So that this towne all that time, by reason of the great concourse of people that had recourse unto the prince (for it is remembred of him that he intertaind all his tennants that were any way impoverishd, and made serve all the poore that camc to his gates; so that he spent yearly upon such as came to beg att his gates 120 quarters of meale), became very populous, and had in it abundance of victuals, so that it was thought to be the chiefest towne in all Lothian, except Edinburgh and Hadintone. He rewarded the masons according to their degree: as to the master masone, he gave 40 pounds yearly, and to every one of the rest he gave 10 pounds, and accordingly did he reward the others, as the smith and carpenters, with others."*

This chapel still forms an exquisite monument of the taste of the architect, the founder, and of the period. There is not perhaps a more perfect or a more elegant specimen of what is commonly called the florid Gothic style extant. This style, however, in the instance of Roslin Chapel at least, is a compound of many styles, uniting, it is said, the Egyptian, Grecian, Roman, and Saracenic. The arch in particular is exhibited in all its possible forms and principles, there being no less than thirteen varieties. The interior is divided into a centre and two aisles by two ranges of clustered pillars, supporting a vaulted and decorated roof. The capitals of the pillars are encircled with foliage, and are ornamented with various figures representing scenes of Scripture history. One of the pillars is beautifully wreathed with foliage. The arches between the pillars are wonderfully rich, as indeed is almost every part of the building. The structure is incomplete, the chapel, as it is called, consisting only of a chancel and part of the transept. The height within is about forty feet, the breadth thirty-four, and the length sixty-eight. The sacristy, vestry, or subterraneous oratory, was founded by the lady of the founder of the chapel, "Dame Elizabeth Douglass." The chapel itself was completed by Sir Oliver Sinclair, the founder's son, whose promotion to the command of the Scottish army, raised for the invasion of England, created the disgust which brought on the route at Solway Moss. The establishment was at that period intended for a provost, six prebendaries, and two singing boys. During the Revolution the edifice received considerable damage; perhaps its present incompleteness of outline is owing to the injuries then received. In a vault beneath the chapel pavement were buried ten barons of the family, encased in their respective suites of armour: in this state they lay on the floor without coffins. Sir Walter Scott alludes to this circumstance in his 'Lay of the Last Minstrel,' where he describes an old superstition attached to the family, that at the death of any one of its members, the chapel was to be seen covered with flames, without however experiencing any injury. There is here the tomb of a Sir William St. Clair, with a representation of the knight in armour, and a greyhound at his feet; and on the capital of one of the columns are the figures of a deer and a boy: both the tomb and the figures are supposed to refer to the chief actors in the following traditional story:—

Robert Bruce, king of Scotland, in following the chase on Pentland Hills, near Roslyn, had often started a "white faunch deer," which had as often escaped from his hounds. Surprised at this, the monarch asked his nobles one day when they were assembled round him, if any of them had dogs which they thought would be more successful? At first all were silent, for the true courtiers were fearful of offending by even hinting at a competitorship with the king. At length Sir William St. Clair of Roslyn boldly but unceremoniously said, "he would wage his head that his two favourite dogs Hold and Help would kill the deer before it could cross the March-burn." The king instantly caught at his unwary offer, and betted the forest of Pentland Moor against the proposed wager. An early time was appointed to decide the event; all were expectant, all were anxious; the heart beat alternately with hope and fear. The hunters reach the "heathern steeps," and Sir William, posting himself in the best situation for slipping his dogs, prayed devoutly to Christ, the Virgin Mary, and St. Katherine. The deer is started, the hounds are slipped; when Sir William spurs his gallant steed and cheers the dogs. The deer reaches the middle of the March-burn brook, the hounds are still in the rear, and our hero's life is at its crisis. An awful moment: the hunter threw himself from his horse in despair, and fate seemed to sport with his feelings. At this critical moment Hold fastened on his game; and Help coming up, turned the deer back, and killed it close by Sir William's side. The generous monarch embraced the knight, and bestowed on him the lands of Kirktown, Logan House, Earnsham, &c., in free-forestie. Sir William, as an acknowledgment, and in gratitude for St. Katherine's intercession, built a chapel to her memory in the Slopes, where its cemetery still remains. The hill where the monarch viewed the chase is yet called the King's Hill, and the place where Sir William hunted is still called the Knight's Field.*

Near Roslin Castle were fought no less than three battles in one day, Feb. 24, 1303, between the English, under the command of John de Segrave, and the Scotch, under Sir Simon Frazer and John Comyn. The English, consisting of 30,000 troops, were divided into three bodies, posted at some distance from each other. The Scotch, who, according to their historians, did not exceed in number 10,000, attacked the first division of the English, and completely overpowered it. The other divisions, now advancing, were attacked one after the other, and both also defeated. Hawthornden, the beautifully romantic seat of the poet Drummond, is within half a mile of Roslin Castle.

* Manuscript Memoir of the House of Douglas, in Richard Augustine Hay's collections.

HISTORY OF A MAHOGANY TABLE.—II.

[Continued from No. 530.]

The transformation of a mahogany log into a table does not always imply that the whole table is made of mahogany; for if the surface of the top, or bed, and the legs, are formed of that wood, it obtains the name of a mahogany table, whether the concealed parts be made of that wood or of deal. The cheaper the article produced, the more likely are the unseen parts to be made of common materials. Let us suppose then that our table is to present a respectable appearance at a moderate price; that the broad surfaces are veneered, and that the turned legs, &c. are made of solid mahogany.

The first thing to be done is to form the framework, which is to be supported by the legs, and which is in its turn to support the top of the table. This framework may be considered in the light of neat carpenter's or joiner's work, so far as joints, &c. are concerned. The planks which are to form it are selected of the proper thickness, and sawed to the proper width. This operation of sawing is not so easy as lookers-on are apt to imagine. The plank is laid across one or two sawing-stools, and the saw penetrates it nearly in a perpendicular direction; but if the latter be held too upright, it is liable to tear away splinters from the under side of the

* Britton's 'Architectural Antiquities:' Account of Roslin Chapel.

wood; and if the blade of the saw be not kept rigorously in the same plane, it will be worked with great difficulty, and the wood will be cut in a crooked direction. The saw used for cutting or "ripping" a plank into narrower pieces has no frame or strengthener at the back edge, since this would impede the progress of the saw through the wood. The cross-cutting of the pieces to the requisite lengths is a less difficult task, on account of each cut being only a few inches in length.

The next operation after the cutting of the planks is that of planing or smoothing the various surfaces. This is sometimes done when the plank is in the whole or uncut state; but whether before or after the sawing, the mode of producing a smooth surface is pretty much the same. There are planes of different sizes employed, according to the roughness of the wood. The first is a long coarse plane called the jack-plane; and with this the first roughness of the wood is taken off. It is succeeded by another plane, rather broader and heavier, called the trying-plane: this has a very smooth and true edge, and brings the surface of the wood to a true level. But it is likely to happen that neither of these planes is capable of reaching any little depression there may be in the surface of the wood, and that the latter accordingly remain rough. In such a case a third plane is used, called the smoothing-plane; it is much smaller than the others, and is particularly useful where the wood is hard, or where the pieces to be planed are of small size. The plank or piece of wood, while being planed, is kept firmly down upon the bench by means of a stop or fastening at the end; and while the edge is being planed, the plank is fixed edge uppermost in a kind of long vice attached to the front of the workman's bench. During the progress of the planing, squares are occasionally used, to determine the true level of the surface, the rectangular position of the edges, &c. These squares are of different kinds and sizes, according to circumstances; but there are generally two arms or branches fixed at right angles to each other.

The modes of sawing and planing do not differ much for the different parts of a piece of furniture. Whether we are speaking of the top or bed of a table, the framework, or the drawers (if it have any), the various pieces are cut or planed nearly in a similar manner, the chief difference being that the harder the wood may be, the sharper and better must be the tools employed to work upon it. If, however, any portion of the woodwork be curved or arched for the sake of ornament, the sawing then requires more care, since the saw has to be carried round in the direction of the curve, instead of following a straight course.

One distinction between the work of the carpenter and that of the cabinet-maker is, that the latter uses very few nails to secure the different portions of his work; while the former uses a great number. Numerous as are the pieces forming a mahogany table, there is scarcely an iron nail to be found throughout it. One reason for this is that the head of a nail would present an unsightly appearance in a mahogany article of furniture; but besides this, peculiar joints are made, which, with the aid of glue, render the use of nails quite unnecessary. A great variety of joints are known to the cabinet-maker, each of which is useful under different circumstances. One is called mitreing, and is similar to that by which the corners of picture-frames are joined. Where two pieces of wood are to be joined at right angles to each other, if the ends be cut at an angle of 45°, and then fastened together, the right angle is produced. This is called mitreing, and is thus effected:—the pieces of wood are placed in or close to a mitre-box, which is a contrivance for guiding the saw exactly at the required angle, so that the ends of the pieces of wood to be joined may be cut off at that angle (45°): the mitre-box is then exchanged for a shooting-board, which is merely a guide for a large plane, by which the angular end of the piece of wood is planed quite smooth without altering the angle. The pieces thus prepared, when glued together, would constitute a rectangular frame. Another kind of joint, still more frequently used by the cabinet-maker, is that called dove-tailing. This is a curious kind of interlacing of the ends of one piece of wood with those of another; the end of one piece being cut into a series of notches or holes, and the end of the other piece, to be joined to the first, being cut so that projecting pins shall be left to fit into those notches. Each piece of wood is fixed endwise in a vice, and the shapes and sizes of the notches and pins marked in pencil. By the united aid of a small saw and a sharp chisel, little pieces are cut from the two ends of each piece of wood, in a somewhat battlemented manner, and with such uniformity, that the pins of one piece shall be exactly the same size and shape as the notches in the other. Sometimes this dove-tailing is done in such a peculiar manner that nothing of it appears externally. As to the term dove-tail, it appears to have arisen from a fancied resemblance between the pins and the shape of a dove's tail, though this resemblance is certainly somewhat forced.

It is by the last-mentioned kind of joint that the frame of a table is generally put together, glue being used to assist in retaining the joints. Of glue we may merely remark that it is produced from the hoofs of oxen, and other coarse animal substances containing gelatinous matter, which are boiled in water to the consistence of a stiff jelly: this, whatever be the nature of the woodwork on which it is employed, is laid on with a brush while quite warm; and if the joint be well made, it will become, when the glue has hardened, nearly as firm as the solid wood itself. In the frame of a table, after the dove-tailing and glueing of the joint are completed, there are generally blocks of wood placed in the angles and corners, to assist in keeping the frame work together; and if the table be large, there are cross-pieces, or strengtheners, placed from side to side of the frame.

We suppose our table to have one or two drawers, of which the front will be made either of solid mahogany or veneered upon deal, and the bottom, back, and sides will be either of mahogany or deal, according to the excellence and price of the article to be produced. In either case the drawer itself is made nearly in the same way; it is in fact a neat kind of box, of which the front only is required to have anything like a handsome appearance. The corners or joints of a drawer are usually dove-tailed, and strengthened by small blocks of wood afterwards glued in. The thickness of the wood required for the drawer will depend usually on its size, but the front, which is the only part that meets the eye when the drawer is closed, is usually stronger and thicker than the other parts, in order to afford sufficient space for the handle, keyhole, lock, &c. The framework of the table must of course be so shaped as to leave a neat and well-fitting groove in which the drawer may slide. It is not necessary for the drawer to rest or slide on a bottom of wood; it is sufficient that a ledge or groove exist at the side of the drawer which shall work in a convenient way in the side of the frame.

The legs of the table, if they be square or nearly square, can be prepared by the cabinet-maker out of a thick plank of mahogany by the aid of his saws and planes; but as it is usual for a mahogany table to have turned legs, we will assume such to be the case in the present instance. In such a case the cabinet-maker has very little to do with the legs until the turner has performed his part, for it is very seldom that a cabinet-maker is at the same time a turner. The art of turning is familiar enough to those who have witnessed it; but to those who have not, it is difficult to convey a description in writing. The piece of wood to be turned is first brought by the saw into something approaching to the

proper dimensions, and then fixed upon an instrument called a lathe, in such a manner that a rapid rotatory motion may be given to it, by the pressure of the foot of the workman on a treadle beneath. The humble itinerant knife-grinder's machinery will show us how a rotatory motion is produced by such means. While the piece of wood is rotating, the turner places a sharp chisel or gouge against its surface, so as to cut away the wood as fast as new portions are presented to its edge by the rotation. In sawing, planing, or carving, the cutting-tool moves onwards, while the wood is stationary; but in turning, the tool is nearly stationary, and the wood turns round to meet its edge. Considerable dexterity is required in preventing the cutting-tool from digging too deeply into the wood, or from varying its distance from the axis of the piece of wood. As a circular leg for a piece of furniture is almost always more or less ornamented with mouldings, curves, &c., these mouldings are produced by using cutting-tools of different sizes and shapes, and by cutting deeper towards the axis of the wood in some places than in others. The varieties of pattern that may thus be produced are of course interminable, and great scope is left for the workman to display his taste. Where the table, such as we now suppose it to be, is one standing on four legs, the turning is in general not so ornamental as in those large central tables where there is one massive leg or pillar in the middle, supported by a kind of plinth beneath; in the latter case there is generally some carving introduced in addition to the turning, which is the work of another kind of workman; but this we need not consider here. The mahogany employed for the leg of the table is inferior in quality to that which is cut up into veneers, but superior to that employed for parts of the furniture which are but little seen; and as the legs are not veneered, the surface of the wood of which they are made must be brought to an appearance, as to smoothness, &c., fit to meet the eye.

The upper end of each leg is generally left square, and either fastened to the framework of the table in some secure manner, or else the pieces which form the frame are fixed to the legs instead of being framed to each other end to end. Where the parts are united in the last-mentioned manner, the joint is generally that which is called tenon and mortise, a kind of joint which is very much used in carpentry, but not so extensively in cabinet-making; dove-tailing is usually employed when two pieces of wood are joined end to end; but tenon and mortise is the more frequent joint when the end of one piece of wood is fixed to the side of another: the latter is the case with respect to the legs and frame of a table. The tenon-and-mortise joint consists simply in this:—a hole is chiselled completely or partially through the thicker piece of wood (in this instance, the leg): the height and width of this hole are rather less than the width and thickness of the smaller piece; and the end of the latter is cut away until it exactly fits the hole. When the two pieces are fixed together, the mode of joining can scarcely be seen, and yet possesses considerable strength. The mode of fixing the legs to the framework must depend principally on the form of the table, and whether or not there is a drawer to it; and more or fewer strengthening blocks will be required according to the size of the table.

There are two other points which we have to mention respecting the legs of our table, viz. the hinges and the castors. One of the most useful contrivances in a table is that of having moveable flaps, which move on hinges, so that the table can be reduced within a narrower compass when not in use. In this case the bed of the table consists of three pieces, of which the two at the sides are connected with the central ones by hinges: these hinges allow the flaps to fall when there is no support beneath; but when the flaps are to be raised to a horizontal position, there must be something to support them. Now, this support is sometimes produced by fixing two of the legs, not to the firm frame of the table, but to separate pieces connected with the frame by hinges. Each moveable leg thus does double service. When the flap is down, the leg is in its proper place at the corner of the frame of the table; but when the flap is up, the leg is brought round beneath the middle of it as a support. In other cases all the legs are fixed in their proper places, and there are one or two brackets hinged to the outside of the frame in such a manner as to form supports of the flaps, when the latter are lifted up, and the brackets are turned round on their hinges. If this mode be adopted, the hinges employed for the brackets are generally the ends of the pieces of wood themselves, cut so as to lap into one another, and an iron wire or spindle is run through them as an axis.

As to the castors, they are little brass wheels affixed to the bottom of the legs; but they not only have a revolution on their spindles or axes, for the axes themselves turn round, so that the wheels may turn in any direction. Much ingenuity has been shown of late years in the construction of castors; having for their object the ensuring of an easy movement of a piece of furniture to any part of the room: the cabinet-maker has, however, nothing further to do than to screw them to the legs of the table, &c.

The important affair of making the veneered top to our table has yet to be described; this we must postpone to another article.

Illustrations of the Permanence of communicated Motion.—It is in the case of a revolving body that we can most effectually diminish these resistances to motion, by causing it to be supported and to turn on a very small surface, as compared with the dimensions of the body itself; as, for instance, a large wheel round a slender axle, or a large spinning-top on a fine point, by which contrivance the resistance of friction is made to act at a great mechanical disadvantage as compared with the force of the body's rotation; and we may, further, remove the resistance of the air, almost to any degree we choose, by placing the revolving body under the receiver of an air-pump. Now, if we thus remove the air from the receiver of an air-pump, and then, without re-admitting it, by some mechanical contrivance put rapidly in motion under the receiver a large wheel with an exceedingly small axis, or, better, a large spinning-top with a fine hard point, we shall find that motion, which would under other circumstances soon cease, lasting, apparently unaltered, for hours: and a pendulum, delicately suspended on knife edges, and having thus yet greatly less friction to contend with than either the axis of a wheel or the point of a top, when once a motion has been given to it, will retain the force of that motion, and continue to oscillate with it for more than a day. Mr. Roberts, of Manchester, is said to have constructed a body which is of such a form, and so truly balanced upon a fine point, that having put it in motion round that point, it would not lose the force of its motion, but continue to spin with it for forty-three minutes. These are all proofs of a tendency to the permanence of motion, and the force of motion which accompanies it, when causes of retardation from without are more or less removed; that is, of its tendency to absolute permanence, so far as any cause within itself is concerned. It does not die or diminish of itself; there is within it no principle of death or decay,—to cease, it must be operated upon by causes external to itself. The proofs hitherto given show, however, only the probability of this truth. When we continually diminish the external causes of a body's retardation, its motion approaches to a state of permanence; and it is probable, therefore, that if we were completely to take away those causes of retardation, permanence of motion would be completely attained. But we cannot take away these causes of retardation—we cannot completely take away friction and the resistance of the air: we can therefore only speak of what would probably happen if these were completely removed. To complete the proof, we must look out for some case of motion, in which there is no friction, and no resistance of the air. Such a motion we cannot find on or near the earth's surface, but we do find it in the heavens. —*Moseley's Illustrations of Science.*

THE PREVENTION AND EXTINCTION OF FIRES.—I.

[Fire-Bell Gate (in which the Curfew was formerly rung), Barking, Essex.]

The sudden destruction of a building by fire is an occurrence so likely to result from the quantity of wood usually employed in the construction of dwellings, &c., and so awful in its consequences, that no wonder need be felt at the precautions and regulations adopted in most countries for the prevention, or at least the extinction of fires. The principal of these precautionary measures we will briefly describe.

Beckmann bestowed much pains on the inquiry, whether any plans were in operation among the ancients for the prevention of fires; but the result obtained is not very satisfactory, chiefly from the difficulty of knowing the precise meaning of terms employed by some of the classical writers: for instance, the word 'sipho' has been used to designate an instrument employed at Rome to extinguish fires; and much indecisive discussion has arisen as to whether that instrument bore any kind of relation to the modern fire-engine. There was, however, a plan proposed by Apollodorus, an architect in the employment of the emperor Trajan, which is capable of being clearly understood; it consisted in the employment of leathern bags filled with water, and having long pipes fastened to them in such a manner that, by pressing the bags, the water might be forced through the pipes to the spot which was in flames. How far this plan was acted on we have no means of knowing. There was an ordinance in force among the Romans, by which each citizen was ordered to keep water always in readiness in his house for the extinction of accidental fires; and in addition to this, there were in Rome, as well as in many other cities, patroles or watchmen, who perambulated the streets at night, both to give an alarm in case of fire, and to guard the houses from robbery, &c.; these watchmen were in some instances provided with bells, and in others with horns.

The cities of the East, both in ancient and in modern times, have been peculiarly subject to calamities by fire, arising principally from the large amount of wood employed in their construction. The suburbs of Constantinople have been repeatedly destroyed or injured from this cause; and the notions of the Turks respecting fatalism act as a great barrier to the adoption of judicious preventive measures. The following remarks of Kempfer, with regard to Japan, will apply to many other parts of the East:—"The houses in Jeddo are small and low, as indeed they are in all other parts of the empire, built of fir-wood, adorned within, and divided into rooms with paper screens and latticed windows; the floors are covered with fine mats, and the roofs with shavings of wood. In short, the whole machine is a composition of such combustible matter, that we need not wonder at the great havoc which fires make in this country. Almost every house has a place under or upon the roof where a tub full of water is constantly kept, together with a couple of mops, which may easily be reached, even outside the house, by the help of a ladder. By this precaution they often quench a fire in particular houses; but it is far from sufficient to stop the fury of a raging flame."

Passing from the countries of the East to those of Europe, we find that precautionary measures were adopted several centuries ago in the cities and towns of Germany, with a view not so much of preventing fires as to give notice to the inhabitants directly a fire broke out. As early as the year 1351, there was a regulation made at Erfurt, that two watchmen should be placed on every steeple at night to look out for fires; and in most fortified cities the guards appointed to look out from the towers and elevated spots, were to direct their attention as much to fires within the town as to the sudden approach of an enemy from without.

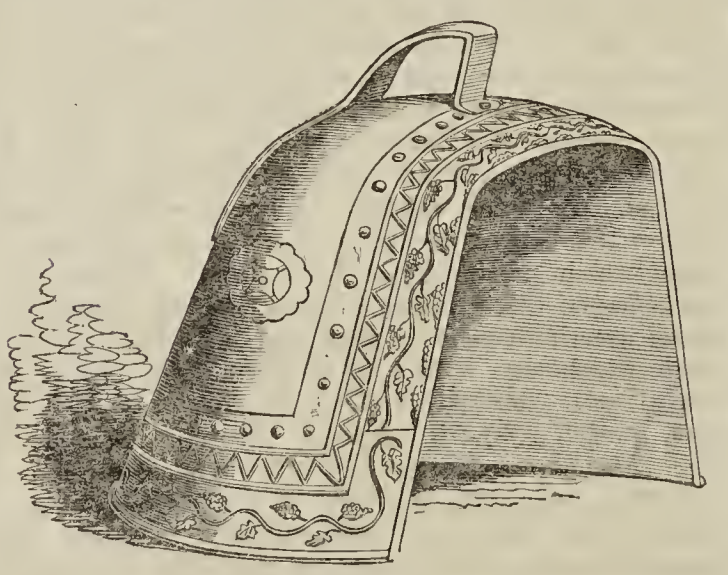
With regard to England, a good deal of discussion has arisen concerning the introduction of the curfew, the earliest regulation concerning fires. William the Conqueror made a law that at the ringing of the curfew-bell, at eight o'clock in the evening, all his subjects were to extinguish their fires and retire to rest. This law has

been made the theme of many accusations against William, as a tyrant and oppressor; and under that impression Thomson wrote the lines—

> "The shiv'ring wretches, at the Curfew sound,
> Dejected sank into their sordid beds,
> And through the mournful gloom of ancient times,
> Mused sad, or dreamt of better."

But whatever else we may think of William's motives, the rude and fragile construction of the dwellings of those periods made the law in many respects a judicious one, by lessening the probability of fire. It appears too that William's law was merely an extension of one which had been made by Alfred the Great, and which was limited to the town of Oxford. In many parts of the Continent likewise, the use of the curfew was so common as to justify William in some respects for the law which he made. Even so late as the latter part of the seventeenth century a fire-bell was rung at a certain hour in the evening at Vienna, as a signal to the inhabitants to extinguish their fires within doors, and to hang up lanthorns in front of their houses.

The term curfew (called also by some Scottish writers curphour) is derived from the French *couvre-feu*, implying fire-cover, and appears to have been the name given to the instrument with which the domestic fires were extinguished. Some years ago Mr. Grose gave a description, in the 'Antiquarian Repertory,' of an ancient curfew in the possession of the Rev. Mr. Gostling. This instrument was made of pieces of copper, riveted together (since solder would have been liable to melt with the heat): it was ten inches high, sixteen inches wide, nine inches deep, and shaped somewhat like the common domestic Dutch oven. The mode in which such an instrument appears to have been employed was this:—no stoves or grates were used in those days, but the fuel was kindled on a hearth; and when it was desired to extinguish the fire, the wood and embers were raked as close as possible to the back of the hearth, and the curfew put over them, the open part being placed close to the back of the chimney. The air was almost wholly excluded by this means, and the fire soon died away.



Couvre-feu.

From a drawing furnished through Francis Grose, from the Rev. F. Gostling, in 'Antiquarian Repertory,' vol. i.

When the custom of ringing the curfew-bell at eight o'clock in the evening ceased, many towns and large buildings were provided with a fire-bell, that is, a bell which, being rung only when a fire occurred, was sure to attract the attention of the neighbours, and to induce them to render speedy assistance. Such bells are still occasionally to be seen attached to old buildings. It was stated a few years ago, that at Hoddesdon, in Hertfordshire, the old curfew-bell, which was anciently rung at four in the morning and eight in the evening, as a signal for the kindling and the extinction of fires and candles, is still in existence; but that the only use to which it is now applied is to warn the inhabitants at four in the morning of Shrove Tuesday, that pancake time is arrived, and at eight, in the same evening, that this annual feast has terminated; and that the inhabitants, by an old custom, strictly conform to this regulation.

It will be obvious that patroles, fire-bells, &c. are of no avail for the prevention of fires; they are only calculated to bring speedy assistance after a fire has broken out. The only means of preventing a fire are—increased care on the part of individuals, and the employment of incombustible materials in the construction of houses; and to attain the latter point as nearly as possible has been the object of much attention among ingenious persons. In the early part of the last century Dr. Hales communicated to the Royal Society a method of preventing the spreading of fire, founded on an experiment which he made on the non-conducting powers of earth and sand. He put a layer of damp garden-mould, about an inch thick, on a piece of fir-plank about half that thickness; he then kindled a fire on the mould, and kept it up pretty fiercely by blowing: two hours elapsed, however, before the plank was burned through, and this occurred without any flame. He therefore proposed to protect a house adjoining another which is on fire, by covering the stairs and floors with a layer of damp sand or earth.

About seventy years ago Mr. Hartley devoted a good deal of attention to the perfecting of a method by which the liability of firing a house might be lessened: this method was to nail thin iron plates to the tops of the joists beneath the flooring-boards, and in every other part where practicable, in order to prevent the communication of flame from one part to another. The same period witnessed the prosecution of experiments to obtain similar results, on the part of Earl Stanhope, who distinguished himself by many ingenious suggestions and inventions in matters relating to the arts and sciences. He proposed to fix oak or fir laths crosswise between the joists, and to coat the whole, both joists and laths, with a thick layer of plaster: this plaster was composed of one measure of common rough sand, two of slacked lime, and three of chopped hay, mixed with water and beaten up into a stiff mortar. A layer of sand was placed on the plaster which covered the joists and laths; and when the plaster and sand were quite dry, the flooring-boards were to be laid down. Mr. Hartley and Earl Stanhope, both of whom were influenced by benevolent motives, and without any view to pecuniary interest, made a great number of experiments on the efficacy of their respective modes in preventing the spread of fire; but although the result of their experiments seemed to be satisfactory, it does not appear that their methods were acted on by others.

Many somewhat similar attempts have been made during the present century; but the one which seems to have been most successful is that which was largely noticed about two years ago in the public journals, and which is due, we believe, to a Mr. Davies. A house, or rather the shell of a house, was purchased, near London; and the whole of the timbers, floors, ceilings, stairs, and other portions of wood-work were completely coated with a certain composition. When this was dried, some of the rooms were furnished with the common articles of domestic furniture, small in value, but of the usual nature as to combustibility, &c. A large quantity of shavings and pieces of wood was strewed on the floors of the several rooms; and on a given day each room was set on fire. Every article in each room was completely consumed; but in no one case did the fire penetrate to the wood-work of the room, or pass from one room to another: some gunpowder was placed between the ceiling of one room and the floor of the one above it; but neither the fire above nor that beneath had any effect on the gunpowder. A similar experiment was made at another spot; and, we believe, the result was such as to lead to the formation of

a company to carry the plan into operation on a larger extent.

Within the last few years plans having the same object in view have been suggested in great number; in some it is proposed to line ceilings, &c. with sheet-iron; others for sheet-iron substitute sheet-zinc; some advocate a joint employment of sheet-iron and plaster; and others again give recipes for fire-preventive paint, to be applied in the manner of common oil-paint to the surface of wood. In short, attention is now so much directed to this subject, that we may fairly expect the time to be not very far distant when the principle of fire-prevention will form part of the system by which most houses will be built; until this is done, we may look forward to a repetition of the same kind of distressing calamity by fire which so often comes under the public eye.

THE SWEATING SICKNESS OF THE FIFTEENTH AND SIXTEENTH CENTURIES.

The epidemical visitations of this fatal disease, called also, from its being erroneously supposed to be limited to the English, the "English Sweat," or "English Disease," and "Ephemera," from its attack only occupying one day, presented some features of an extraordinary and interesting nature.

Appearing for the first time in the army of the Duke of Richmond, afterwards Henry VII., upon his landing at Milford Haven, in 1485, it soon spread over the kingdom. Holinshed, in his 'Chronicles,' speaking of it, says:—"In the same yeare a new kinde of sicknesse invaded sodeynely the people of this lande, passing through the same from the one ende to the other. It begann about the 21st September, and continued till the latter ende of October, being so sharp and deadly that the lyke was never hearde of to any manne's remembrance before that tyme. For sodeynely a deadly burning sweate so assayled theyr bodies and distempered theyr blood with a most ardent heat, that scarce one among one hundred that sickened did escape with life: for all in manner as soone as the sweate took them, or within a short tyme after, yelded up the ghost. Besyde the great number which deceased within the citie of London, two mayres successively died within eight daies, and six aldermen. Thus this disease comming in the fyrste yeare of King Henrie's reigne, was judged (of some) to be a token and signe of a troublous reigne of the same king, as the profe partly afterwards shewed itselfe."

Another but less severe visitation occurred in 1506. In 1517 it raged with great virulence, and manifested one of its characteristics in attacking, contrary to what is usually the case with epidemic diseases, rather the upper than the lower classes, so that many of the Court fell victims to it, and the law courts were all closed. Speaking of this attack, Holinshed says:—"The sweate was so fervent and infectious, that in some townes half the inhabitants died thereof, and in some a thirde part."

In 1528 it again appeared; but although numbers were attacked, owing to the improvement in the mode of treating the disease, the mortality was not so great. Bellay, Bishop of Bayonne, ambassador here at that period, and himself a sufferer, says that out of forty thousand affected, only two thousand died. But owing to the want of exact registries this can only be supposed an approximation to the truth. However, those of high rank were again the chief victims, and the king himself was at one time in danger. The last irruption of the disease, in 1551, was one of the most malignant. In Westminster alone one hundred and twenty persons died in one day, among whom were two sons of Charles Brandon, both dukes of Suffolk. Dr. Keyes, or Caius, a physician practising at Shrewsbury at that time, gives, in his curious "Booke or Counseill against the disease commonly called the Sweate or Sweating Sicknesse," a copy of which is preserved in the British Museum, a fearful, though quaint description of its virulence, stating that in the town of Shrewsbury alone six hundred perished.

The popular belief in this and other countries was that the ravages of this disease were confined to the English, and that not only were foreigners exempted from its influence while residing here, but that the English were also exclusively liable to it even during their visits in foreign parts. Not only did the disease, however, first manifest itself among the foreign levies of the Duke of Richmond, but foreigners residing in England were not wholly exempted from its influence. Again a similar epidemic ravaged Holland and Germany in 1529, as recorded by Wierus and Erasmus (himself an eye-witness); while another, recorded by Godfrey Welsch as appearing at Leipsic in 1652, traversed nearly all Germany between that date and 1680.

The summer season was the period this disease usually appeared, and it continued active generally from three to five months. The attack was far more sudden, and its progress much more rapid, than that of the plague itself. Persons, especially those who appeared in robust health, were seized under all circumstances, whether occupied in pleasure or business, or even during sleep. In the malignant epidemics, life was sometimes extinct even in one, two, or three hours, the general period of the disease being, however, fifteen; while if the patient survived twenty-four hours, his life was considered as saved. The having had it was no preservative, many being attacked two or three times. It began with pain, great feverishness, and unquenchable thirst, which were presently followed by profuse sweating, during which, in bad cases, the patient speedily sunk. Not only were the poorer sort of persons much less liable, but children and old people were in a great degree exempt, those of middle ages chiefly falling victims.

The nature and cause of this disease has naturally occasioned much discussion. Dr. Caius considers it as a fever derived from infection, to which the high living among the better classes of those times rendered them susceptible; and that the sweating is produced by the efforts nature makes to resist the admission of the noxious agent. Lord Bacon, in his 'History of Henry VII.,' says, "This disease appears rather a surprise by nature than otherwise; for if taken in time, it was not obstinate to be cured." Most authors are agreed as to its infectious nature, and that it probably was imported by the troops brought over by the Duke of Richmond, who were described by a contemporary writer, Philippe de Comines, as being composed of the very dregs or outcasts of society, or that it was generated among these during their passage in the crowded transport-ships. Dr Mead considers the sweating sickness to have been neither more or less than a modification of the common plague, and rather vaguely attributes its various appearances to importations from Turkey. He also instances a very similar disease which occurred in 1713, called the Dunkirk Fever, because brought to this country by the soldiers from Dunkirk, while the true plague was spread from the same source over other parts of Europe. An able writer in the 'Edinburgh Medical Journal' seems to entertain similar opinions, for he says, "Experience has shown that the pestilential fevers which at different times have afflicted mankind, although alike in their principal symptoms, yet differ so much in their mode of attack, and in the train of morbid associations, that they seem, as it were, to constitute so many different diseases; and since words are admitted for explanations, and diseases are classed according to a particular symptom, or to some affection of a particular part, without attending to the whole combination of symptoms, epidemics will have different names at different times; and what one writer calls the plague, another called dysentery, and a third may style the sweating sickness."

Putting aside the disposition of this epidemic to affect especially the robust and that portion of society who were not exposed to want or privation of comfort, many of its other features resemble those of the various visitations with which this country has been afflicted, both in more ancient and more recent times. Among these are its periodical appearance and subsequent entire cessation. The same have been observed in the plague and other analogous diseases; but upon this point we cannot do better than quote another passage from the judicious writer before mentioned, which, by those who recollect the unprepared state in which the cholera found this country, will be found to contain a judicious caution, written long before the appearance of that terrible disease, and attention to which would probably have diminished the number of victims on that occasion.

"If we observe with attention the course of the plague, small-pox, measles, and other contagious diseases, we perceive they all have a tendency to rage with great violence in particular places, after certain intervals. People become negligent of the means of preventing infection, until their attention be awakened by the breaking out of the disease in their neighbourhood; a general inoculation, or a general cleaning and whitewashing, then takes place; tranquillity of mind follows, degenerating soon into a forgetfulness of what has once happened, and indifference to the means of prevention. A new series of calamities is necessary to excite their attention again, and no wonder, when the remedy is applied in a number of places at the same time, that those places should remain free from the disease for nearly the same period; and when the contagion is brought by accident, or is generated in one place, that becomes a signal for others liable to the same fate. This at least seems to be the case with typhus fever and small-pox; and if the vaccine inoculation be not strenuously urged, a vast crop of patients will spring up in a few years, liable to be destroyed by that dreadful plague." That the prophecy concerning the small-pox, delivered in the above sentence thirty years ago, has been amply verified, may be judged from the well-known increase of that disease of late years, and the recent determination as to the propriety of legislative interference for the extension of the safety afforded by vaccination.

The latter epidemical attacks of the Sweating Sickness were much less proportionally mortal, and this would seem to have been brought about by a mode of treatment not at first of obvious propriety, viz. the encouragement by every possible means of the sweating stage of the disease. Dr. Caius's 'Booke,' itself a most amusing specimen of learned pedantry, is very explicit upon this point, and the directions given imply considerable powers of endurance on the part of the patient. Thus he must be freely plied with warm drinks, nearly smothered with bed-clothes, and sleep strictly forbidden him. "Do not let them on any account sleep, but pull them by the ears, nose, or hair, suffering them in nowise to sleep until such time as they have no lust to do so: except to a learned man in physic, the case appears to bear the contrary." Holinshed, praising the efficacy of this mode of treatment, says:—"Mark one point diligently: above all others, this one is to be observed, that he never put his hande or feete out of the bed to refreshe or coole himselfe, which to do is no less jeopardie than short or present death."

M. Rayer has published a description of a very similar though far less mortal epidemic which visited the departments of the Seine and of the Oise in 1821: of two thousand six hundred and fifty-seven persons attacked, only one hundred and sixteen died. He has collected accounts of a great number of other epidemics which have been known in that part of France under the name of the "Picardy Sweat" from the year 1718 to the time in which he wrote. He also takes occasion to prove, that not only other parts of France, but that Italy, Switzerland, and Germany have on various and frequent occasions been liable to similar visitations since the occurrence of the Leipsic epidemic in 1652.

All knowledge communicated in the right manner, in due degree, and at fit times, is but the handmaid to religion and virtue; and in proportion as the mind is purified and elevated by true religious principles and feelings, the natural healthy appetite for knowledge will be increased, and the soil prepared for its reception.—*Mrs. Hippisley Tuckfield's Letters to a Clergyman.*

Camp of the Snake Indians.—Early in the morning I strolled into the Snake camp. It consists of about thirty lodges or wigwams, formed generally of branches of trees tied together in a conic summit, and covered with buffalo, deer, or elk skins. Men and little children were lolling about the ground all around the wigwams, together with a heterogeneous assemblage of dogs, cats, some tamed prairie wolves, and other '*varmints*.' The dogs growled and snapped when I approached, the wolves cowered and looked cross, and the cats ran away and hid themselves in dark corners. They had not been accustomed to the face of a white man, and all the quadrupeds seemed to regard me as some monstrous production, more to be feared than loved or courted. This dislike, however, did not appear to extend to the bipeds, for many of every age and sex gathered around me, and seemed to be examining me critically in all directions. The men looked complacently at me—the women, the dear creatures, smiled upon me; and the little, naked, pot-bellied children crawled around my feet, examining the fashion of my hard shoes, and playing with the long fringes of my leathern inexpressibles. But I scarcely know how to commence a description of the *tout ensemble* of the camp, or to frame a sentence which will give an adequate idea of the extreme filth and most horrific nastiness of the whole vicinity. I shall, therefore, but transiently glance at it, omitting many of the most disgusting and abominable features. Immediately as I entered the village, my olfactories were assailed by the most vile and mephitic odours, which I found to proceed chiefly from great piles of salmon entrails and garbage which were lying festering and rotting in the sun around the very doors of the habitations. Fish, both fresh and half-dried, were scattered all over the ground, under the feet of the dogs, wolves, and Indian children; and others which had been split were hanging on rude platforms erected within the precincts of the camp. Some of the women were making their breakfast of the great red salmon eggs, as large as peas, and using a wooden spoon to convey them to their mouths. Occasionally, also, by way of varying the repast, they would take a huge pinch of a drying fish which was lying on the ground near them. Many of the children were similarly employed; and the little imps would also have hard contests with the dogs for a favourite morsel, the former roaring and blubbering, the latter yelping and snarling, and both rolling over and over together upon the savoury soil. The whole economy of the lodges, inside and outside, was of a piece with everything else about them, filthy beyond description; the very skins which covered the wigwams were black and stiff with rancid salmon-fat; and the dresses, if dresses they may be called, of the women, were of the same colour and condition, from the same cause. These dresses are little square pieces of deer-skin, fastened with a thong around the loins, and reaching about half way to the knees: the rest of the person is entirely naked. Some of the women had little children clinging like bull-frogs to their backs, without being fastened, and, in that situation, extracting their lactiferous sustenance from the breast, which was thrown over the shoulder. It is almost needless to say that I did not remain long in the Snake camp; for although I had been a considerable time estranged from the abodes of luxury, and had become somewhat accustomed to, at least, a partial assimilation to a state of nature, yet I was not prepared for what I saw here. I never had fancied anything so utterly abominable, and was glad to escape to a purer and more wholesome atmosphere.—*Townshend's Excursions in the Rocky Mountains &c.*

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FORESTS OF THE ALPS.

[Pont Alto, near Agordo.]

AMONG the great fir forests of the Alps, those of Styria and of the Tyrol are perhaps the most distinguished for extent and abundance. They cover the middle region of that vast range of mountains, and stretch downwards to the very verge of, and in many parts even encroach upon, the cultivated fields of the lower valleys. The character of the scenery has been thus described by Mr. Beckford :— "There seemed no end to these forests, except where little irregular spots of herbage, fed by cattle, intervened. Whenever we gained an eminence, it was only to discover more ranges of dark wood, variegated with meadows and glittering streams. White clover and a profusion of sweet-scented flowers clothe their banks ; above waves the mountain-ash, glowing with scarlet berries ; and beyond rich hills, rocks, and mountains, piled one upon another, and fringed with fir to their topmost acclivities. Perhaps the Norwegian forests alone equal these in grandeur and extent."* In these districts the people draw almost their entire subsistence from the forests, their chief employment being the cutting down and transplanting the timber, either to the neighbouring salt-mines and iron-furnaces for fuel, or to the nearest navigable stream or river for exportation. Where the forests are on the banks of streams of this kind, the transport is a comparatively easy matter, but the most valuable forests are frequently several miles distant, a circumstance that, but for the discovery of some such ingenious mode as that we are about to describe, would have rendered them perfectly valueless for any commercial purposes. This is a slide or trough, constructed of successive layers of six or eight fir-trees, placed side by side lengthwise, so as to form a semicircular hollow, the trees being made smooth by stripping off the bark. The slide has a gradual descent, sometimes curving in its course round the shoulders of mountains, sometimes disappearing in tunnels cut through the solid rock, whilst at other times again it is borne over yawning ravines, by the tall pillar-like stems of trees. The famous slide of Alpnach was constructed in this manner, and extended from an elevation of two thousand five hundred feet, down to the lake, a distance, according to its route, of between eight and nine miles. Trees a hundred feet long were conveyed this distance in six minutes. The slide however did not permanently succeed in accomplishing the pur-

* 'Italy,' vol. i., p. 70.

poses for which it was designed, and has accordingly been suffered of late years to fall to decay. Its last service was the bringing down timber to be employed in the building of the new and beautiful church of Alpnach.

Slides of the description we have given traverse almost every part of the Alpine forests. Their use is in a great measure confined to the winter season. Early in the spring the wood-cutters set off in troops to begin their business of cutting down the trees, so as to have all in readiness by the time the frost sets in. Their first business is to construct rude huts of logs and branches, in which to reside during their protracted stay. This accomplished, the axe is in requisition, and all day long, and for months together, the forest resounds with its blows and with the crash of the falling timber. The trees are sorted as they are cut down; those fit for masts or other purposes of ship-building being carefully preserved entire, whilst the others are cut up into logs for fuel for the salt-mines, or to be converted into charcoal for the smelting and forging of iron. These logs are heaped up into immense stacks. This work continues, as we have observed, till the winter comes, and the snow is upon the ground. The wood-cutter now puts the cramp-irons on his feet, and conveys the wood, either by hand-sledges or by oxen, to the slide, or to the crown of a neighbouring precipice, if there be one overhanging the stream below. The snow is now partially cleared away from the trough, and a few logs are thrown down to smooth the passage. Water is next poured into it, which quickly freezes, leaving a surface of ice through its entire extent, that of course serves to diminish the friction, and thus to increase the velocity. The trees are now placed in the trough and dismissed, when they at once descend, with almost incredible velocity, to the place of their destination. When the slide terminates on the brow of a precipice overhanging a lake, into which it discharges its burden, the effect is very grand. The trees come bounding forth from the mouth of the slide, leaping in their fall full half way across the broad waters, and falling with a noise like that of thunder, echoed again and again by the surrounding mountains. When the streams traversing the forests are too shallow to transport the timber, a dam is formed where the banks are narrow, and the water allowed to accumulate till it forms a wide lake. Into this the firs from the woods are thrown, till a sufficient quantity is collected; a sluice-gate is then opened, and the great impetus of the pent-up water as it rushes along becomes sufficient to convey the floating timber to the broader stream or river below. On such occasions, as well as in passing cascades, or in falling from lofty heights, the loose timber frequently attaches itself to rocky projections or to matted brushwood, and demands from the wood-cutter the most arduous and dangerous part of his duty. He has frequently to be let down from lofty perpendicular or overhanging rocks to a great depth, with no other support than a rope, in order that with his axe he may clear away the obstructions. Across the rivers, at the entrance of the principal valleys, and in the neighbourhood of the salt-mines and furnaces, a wooden grating is erected, to collect the floating timber. Here each proprietor receives his own from the mass, the logs belonging to different persons being distinguishable by their respective lengths.

The wood-cutters appear to be paid by means of a tax levied on the proprietors for every stack of wood by the owners of the rivers, whose charge for the use of the rivers is also defrayed by the same impost.

A few only of the finest firs are kept to be exported. The mode of transport is to form them into a raft, sometimes three hundred feet long, and which may be frequently seen on the Rhine and on the Danube, floating lazily along, with perhaps ten and twelve huts erected on the roof. The chief places of destination are the ports of the Black Sea and of the Adriatic.

Under peculiar circumstances, as for instance where the forests are on one side of a range of hills, and large salt-works and furnaces requiring considerable quantities of fuel on the other, with no available stream at hand to convey it by a circuitous course,—in cases of this character, the timber is made to ascend the brow of the mountain, in order that it may then descend as usual on the other side. This ascent is thus managed:—a vast inclined plane, called the wood elevator, is constructed from the bottom of the valley to the summit of the height overlooking it. On this waggons run up and down, which, when loaded, are drawn by ropes attached to a kind of windlass, communicating with a water-wheel turned by a neighbouring torrent. Precipices many hundred feet high are thus scaled.

HISTORY OF A MAHOGANY TABLE.—III

Our mahogany table still wants that without which it would not be recognised as a table at all, that is, the flat top: for this the workman must reserve his best piece of mahogany, and must exercise his best skill, since it is that part which comes most frequently under the eye.

Two different modes of proceeding are adopted, according as the top is veneered or not. In the latter case a good, sound, and handsome piece of wood, probably about an inch in thickness, is selected; and as mahogany planks are frequently to be met with two or three feet wide, it is very probable that no glueing will be necessary. The wood is prepared with more care than if it were deal, both on account of the superior appearance required, and of the difficulties which the grain of the wood presents. In planing a piece of deal, if attention be not paid to the direction of the grain, the plane digs up the wood in pieces, instead of taking off a shaving; but on reversing the position of the piece of wood on the bench, all is set right. In planing mahogany, however, this reversing of the wood is not sufficient, on account of the exceeding crookedness, or "crossness" of the grain; and in order to prevent the cutting of the surface in a ragged manner, the iron of the plane is confined by another iron in such a manner as to be able to take off only a very thin shaving from the surface. The surface is planed all over with considerable care, and for a much longer time than if the wood were deal; and even after the plane has been sufficiently used, the surface of the wood is well scraped with a smooth but somewhat blunt steel edge.

Where the top of a table is not veneered, and even sometimes where it is, it is customary to finish the edge with a reeded, hollow, or oval moulding. For everything of this kind, the cabinetmaker, as well as the joiner, is well provided with planes: the iron of each plane is not flat or straight edged, as in those for smoothing, but is cut into the form requisite for producing the moulding, and is fixed in a block or frame whose face has nearly the same figure. The board whose edge is to have a moulding of any sort worked upon it, whether it be the top of a table or anything else, is fixed firmly with the edge uppermost, and then planed to the proper form.

But a veneered table-top is that of which the making is most difficult. As veneering is a plan adopted to save a portion of the expense which would be incurred by using solid mahogany, it is seldom that the veneering is done on mahogany; but a cheaper wood, such as deal, is used for the ground, since it will not meet the eye when the furniture is complete.

As deals are not wide enough to form the top of a table, two or more of them must be glued side by side, to make the necessary width; and this requires us to speak of other kinds of joints than those alluded to in the last paper. We have said that when two pieces of wood are joined end to end, the dove-tailed joint is very much used; and that when the end of one piece is joined to the side of another, the tenon-and-mortice joint is more

employed. Now in the present instance, the joint is different from either of those; for two pieces of wood are united side by side, so that the ends of the fibres do not form part of the joint. In this latter case, if the wood be well seasoned, the edges may be planed at right angles to the surfaces, and then glued together; for if the two edges be brought together truly parallel, the glueing will produce a very firm and excellent joint. For some purposes it is necessary to plough a groove in the edge of one board, and leave a corresponding projection in the edge of the other, so that the two boards in some respects lap over each other. In other instances a groove, or rebate, is made in the edge of one piece of wood towards the upper surface, and in the edge of the other towards the lower surface; so that the projecting part of one piece shall fit into the hollow or groove of the other. We believe however that the common and simple joint is that most frequently employed for a broad slab or surface afterwards to be veneered; and the following plan is sometimes adopted, to prevent the wood from warping, &c.:—those deals are selected which are most free from knots, and are slit down into pieces four inches or four and a half inches wide; these are glued up, an edge which had been nearest the heart of the tree being joined to an outside edge; when the glueings are dry, the board is cut up again into slips, midway between the former joints, and rejoined, a change being made in the order of placing the pieces. By this means the whole top of the table consists of pieces only about two inches wide, glued together so as to lessen as much as possible the liability to warping.

Let us suppose then, that the piece which is to form the top of the table is glued up to its proper size, and ready for veneering; we proceed to speak of this important process. In the first paper we described the means by which the veneers are cut from the log of mahogany; and from the description there given it will easily be understood that both surfaces of each sheet of veneer are left rough by the action of the saw. The cabinetmaker buys the veneer in this rough state, and he must alter the nature of the surface before he can venture to glue it on the work. He cuts a piece of veneer a little larger than the top of the table, to allow for waste, &c., and lays it flat on his bench. He then take a veneering-plane, and works regularly over the whole surface of the veneer in the direction of the grain: this veneering-plane is of small size, and the iron belonging to it, instead of being fine and smooth like that of other planes, is jagged with a number of notches, like the teeth of a very fine saw. With this plane the veneer is worked until all the saw-marks are obliterated, and replaced by regular channels, or rather scratches along the direction of the grain; and the surface on which the veneer is to be glued is scratched with the plane in like manner; the object of these scratches, or this symmetrical roughness, if we may use such a term, is to enable the glue to take a firmer hold.

The glue for veneering should be sufficiently fluid to flow easily from the brush, and the wood on which it is to be laid must be well warmed before a fire. When all is ready, the glue is laid on with a brush, quickly and in plentiful quantity. The piece of veneer is then taken by two persons, laid on the slab of deal, and rubbed backwards and forwards to press the glue into all the little indentations in both surfaces of the wood; it soon becomes so adhesive as to be no longer capable of being moved to and fro, and is then left in its place. The slight pressure it has hitherto undergone has not been sufficient to make the veneer adhere in every part to the deal; and there are many spots where the veneer swells up, in consequence of accumulations of glue beneath. To level these protuberances is a point of much importance, and is effected thus:—a piece of wood about three inches square and an inch thick has a straight strip of iron-plate fixed to one edge, and is called a veneering-hammer; the workman takes hold of it by a handle projecting from the right side, places the iron edge close to the veneer, and, with his left hand resting on the block to increase the pressure, works regularly all over the veneered surface, squeezing out the superfluous glue from every spot where it may happen to have lodged too abundantly. The pressure or rubbing begins at the centre, and proceeds thence towards the edges, where the glue is forced out; from time to time the workman strikes the veneer in various parts; if the sound returned is distinct and solid, it is known that the veneer adheres closely to the deal; but if it is hollow or dull, he infers that either glue or air prevents the contact of the surfaces: in the latter case a greater degree of pressing or rubbing is necessary. Two men are generally engaged at this work, in order to get the veneer firmly pressed down before the glue becomes too cold. As the outer edges are very likely not to adhere closely, they are kept down either by the pressure of heavy weights or by wooden screws often used by the cabinetmaker; these screws consist of two pieces of wood or clamps, which are brought into greater or less proximity by means of wooden screws; they are placed so that the veneered surface shall be grasped between the two clamps, and retained there till the glue is cold. When the glue is cold, the veneer is tried all over again with a hammer, in order to discover, by the sound, whether there are any hollow places beneath; if there are such, they are remedied in a singular manner: a hot iron is laid on the defective part, which thus becomes hot through, and remelts the glue beneath; a small portion of the veneer is also heated from that spot to the nearest edge, and by means of the sort of channel thus produced the glue which had caused the defect is squeezed out towards the edge. This is the only means known for remedying a defect which would spoil the appearance of the table if allowed to remain.

Whatever other part of the table, such as the front of the drawer, or any part presenting a tolerably plain surface, may be veneered, the mode of effecting it is nearly identical with that described above; if the surface be curved, an additional degree of care is required to make the veneer bend round the curvature and adhere to it, but in other respects the process is similar. Generally speaking, where a table is provided with flaps, it is customary to make the flaps of solid mahogany,—indeed the whole top of the table; because there are so many sharp edges exposed when the flaps are down, that a veneered surface would be very liable to be split and broken, on account of the difficulty of making veneers adhere at the extreme edges.

The table-top, whether of solid mahogany or veneered, is usually fixed on the frame-work by screws from beneath; these screws pass obliquely upwards through the frame-work, and penetrate into the top of the table sufficiently to ensure a firm hold, but without appearing at the upper surface. In a flapped table, the flaps are connected with the central part of the bed by a joint, which, as it is frequently in sight, is finished with much neatness; the adjoining edges of the wood, and the hinges which form the connection, are prepared with much care and neatness also.

We have said nothing yet of polishing: our table still retains the appearance which the many processes to which it has been subjected have given to it: the veneered table is, indeed, in a very unsightly condition; scratched, rubbed, and with ragged edges; the finishing and polishing are therefore important matters. The surface of the veneer is, when quite dry, worked carefully over with a scraper, which consists of a flat square piece of steel about three inches long, with both edges very straight and smooth; these instruments are generally made out of old saw-blades. With this tool the veneer is scraped until all the scratches produced by the veneering-plane are removed from the surface, and the whole rendered

level and smooth. This smoothing is further assisted by the use of glass-paper, or sand-paper, which is well rubbed over every part of the veneer; the sand-paper is wrapped round a block of cork or of wood, by way of handle, and different degrees of fineness are used, the coarsest first. This process, to a smaller extent, is necessary for solid mahogany; but as it has not been scratched by the veneering-plane, a less degree of smoothing will suffice.

The table is now ready for polishing, a process which has, of late years, been done in a very beautiful manner. In old dark-looking family furniture, the polish, which used to form the pride of those who assisted in preserving it, was produced by frequent and long continued rubbing alone; furniture oil, which is in fact coloured linseed oil, will produce a good polish, but only after long repeated applications. Another mode long adopted was that of dissolving bees-wax in turpentine, and rubbing it on the wood with a piece of cloth; this produces a polish sooner than oil, but is in many respects inferior to it. The most perfect of all these contrivances is the use of what is called French polish; this is a varnish which is rubbed into the pores of the wood instead of being laid on with a varnish-brush. There are numerous receipts for making French polish, but nearly all of them consist of rectified spirit of wine, gum shell-lac, gum seed-lac, and Venice turpentine; or three out of these four.

Supposing the table to be ready for the polisher, the surface is wetted with oil, which is allowed to remain on for some time to deepen the colour, and is then carefully wiped dry. A piece of flannel is then wrapped up into a hard close coil; and the surface of this flannel is slightly wetted first with a little French polish and then with a little oil; a piece of clean linen is stretched over the coil to prevent any little impurities from the polish from getting on the furniture, and the coil is then rubbed gently backwards and forwards over the whole surface of the mahogany. The oil is no further useful than in facilitating the rubbing of the polish into the pores of the wood; if it is used in too great quantity, the surface of the wood becomes dull in consequence. When the small amount of polish has worked through the linen cloth and spread itself on the mahogany, the linen is removed, a fresh touch of polish and of oil given to the flannel coil, and the process repeated as before. This is continued in the same manner for a long period of time, as the portion of polish actually laid on at each application is a film of the most extreme thinness; indeed polishing is one of those manual employments of which the charge is made almost wholly for the workman's time, since the value of the material used is extremely small.

The polishing of any surface of an ornamental description, or any spots depressed below the common surface, is rather difficult, and requires a good deal of care; if the polish is allowed to remain in a pool, a fine surface cannot be produced; and if no polish at all reaches it, the defect is of course still greater. Sometimes the polish, on account of ornament, &c., cannot be rubbed at all; and it is therefore laid on in those parts merely as a varnish, by means of a brush. We may here remark that the philosophy of the action of a spirit varnish is this:—the solid matter held in solution by the spirit closely adheres to the polished body while the spirit evaporates; when all has evaporated, the minutely divided gums or resins forming the solid matter of the varnish become firmly united in a dry state, forming a glossy envelope to the wood.

Beautiful as French polish appears to the eye, it is not invariably useful, since it is incapable of bearing heat without injury; it is for this reason that dining-tables are generally left without any other polish than that which furniture-oil may gradually impart to them; the hot dishes which these tables so often bear would crack and blister French polish, if that were employed.

Our table is now pretty well finished, as far as we are able to finish it with mere pen and ink. It will of course be understood that any change in the shape or designation of the table is likely to render a different process necessary in some of the parts. We have spoken of a table with a drawer; this drawer will require a handle or two, and perhaps a lock, the fitting of which requires a neat hand and small tools. It might have been a card-table, in which the top is not polished, but is covered with green or blue baize; or a library-table, of which the top is covered with black leather, or some other convenient material. If it were a dining-table, capable of being made three or four yards long, there would be additional flaps, resting on supporters beneath, and bolted to the other parts of the surface. If it were a circular or square drawing-room table, it would have a turned and carved central pillar instead of four legs, and this pillar would rest on a plinth or support which is very likely to have a good deal of carving about it. But in all these cases the making of the table involves pretty nearly the same details as those which have occupied our attention, varied, of course, as circumstances rendered a change necessary. In any case it is worth a thought, and something approaching to admiration, to consider the steps by which the table at which we are sitting has been transformed from a gigantic tree growing in the wilds of South America.

Soil proper for the Vine.—One of the principal causes of grapes not ripening well on open walls in this country is the great depth of *mould* in which the roots of vines are suffered to run, which, enticing them to penetrate in search of food below the influence of the sun's rays, supplies them with too great a quantity of moisture; vegetation is thereby carried on till late in the summer, in consequence of which, the ripening process does not commence till the declination of the sun becomes too rapid to afford a sufficiency of heat to perfect the fruit. To prevent this, the subsoil should be composed of dry materials. It is almost impossible indeed to make a vine border of materials that shall be too dry or porous. It is not mere *earth* that the roots require to come in contact with, to induce growth and extension, but *air* also, which is as necessary to them as to the leaves and branches. The excrementitious matter discharged from the roots of a vine is very great, and if this be given out in a soil that is close and adhesive, and through which the action of the solar rays is feeble, the air in the neighbourhood of the roots quickly becomes deleterious, and a languid and diseased vegetation immediately follows. But if the roots grow in a soil composed of dry materials, mixed together in such a manner as to possess a series of cavities and interstices, into which the sun's rays can enter with freedom, and there exert their full power; the air in which the roots perform their functions becomes warm and purified, they absorb their food in a medium which dissipates their secretions, and a healthy and vigorous vegetation is the never-failing consequence. All borders, therefore, made expressly for the reception of vines, ought to be composed of a sufficient quantity of dry materials, such as *stones, brickbats broken moderately small, lumps of old mortar, broken pottery, oyster-shells, &c., &c. Bones*, however, on account of their prolonged effect, are by far the most valuable manure that can be deposited in a vine border. They should be buried in the soil whole, and as fresh as possible. Every variety of size may be procured, from the smallest bone of a fowl to the largest bone of an ox. The small bones will decompose in a few months, but the largest will remain for twenty, thirty, and even fifty years, before they are entirely decayed, while the intermediate-sized ones, according to their respective kinds, will be continually decomposing in succession for a great number of years, yielding thereby a constant supply of nutriment of the most valuable description. It is worthy of remark also, that every bone, whether small or large, after it has been deposited in the soil a few weeks, will begin to yield, by the decomposition of the gluten on its surface, a steady supply of nutritious matter, and continue so to do until it be resolved into its constituent parts, and form part of the soil itself.—*On the Cultivation of the Vine on Open Walls, by Clement Hoare.*

THE PREVENTION AND EXTINCTION OF FIRES.—II.

[Continued from No. 531.]

[The first Fire-Engine. From an etching by Van der Heyden.]

In our last article on this subject we noticed the chief preventive measures which have been proposed from time to time to guard against fire in buildings. We have now to describe the modes of extinction usually adopted when prevention has failed.

Water seems such a natural antagonist to fire, that it is no wonder attention was early directed to its use on such occasions; but as the mere act of pouring water from buckets upon the flames of a burning house is but little calculated to check their progress, we find that attempts were frequently made to obtain a continuous stream, which might be propelled from a distance. The first instrument employed in England for this purpose was probably the water-squirt or hand-squirt, numbers of which were kept by the parish authorities, as the small fire-engines now are. The hand-squirt was usually between two and three feet in length, with an aperture at the lower end about half an inch in diameter, and a capacity of about half a gallon. It had a handle on each side; and the mode of using was this: two men held the squirt by the handles and the nozzle, while a third worked a piston within it in the manner of a syringe: the aperture was held downwards in a vessel of water, while the squirt was being filled; and upwards, when the water was to be propelled on the burning materials:—it was in fact precisely the same in principle as the common boy's squirt. After the great fire of London, the number of these squirts was ordered to be greatly increased; but they were in a short time superseded by the fire-engine.

About the end of the seventeenth century, one Zachary Greyl, a Pole, announced that he had devised a method of extinguishing fires, which he would promulgate on the payment of a certain sum, either by the government or by private individuals. His plan, as is usual in such cases, failed to produce any pecuniary benefit; nor does it appear that it was worth purchasing. A wooden vessel was provided, capable of holding a considerable quantity of water; and in the centre of this was fixed a case made of iron plates, filled with gunpowder. From the inner vessel to the head of the larger one proceeded a tube or pipe containing a composition easily ignited, and reaching down to the gunpowder. When an apartment was on fire, the composition was to be ignited, and the machine carried into the room: in a few minutes the effects of the ignition would reach the gunpowder, an explosion would take place, the two vessels would be burst to pieces, and the water in the outer one would be scattered about with great violence upon the burning materials. Such was the proposed action of Greyl's machine; but it requires little penetration to perceive that such a plan was not likely to become prevalent, since not only would the effects be insignificant against a powerful flame, but the whole machine would be destroyed in once using.

Far more worthy of notice is the *fire-engine*, for which we are indebted to Holland and Germany, although great improvements have been made in it in England within a recent period. John Hautsch of Nuremburg, and John and Nicholas Van der Heyden of Amsterdam, appear to have been the first, during the seventeenth century, to pay attention to the construction of these machines. There were, it is true, machines called water-syringes made by Anthony Blatner at Friedburg, so early as the year 1518; but the nature of those machines is now unknown: we proceed therefore to notice the fire-engine.

Caspar Schott, a Jesuit residing at Nuremburg, in a work written by him, alluded to a fire-engine constructed by Hautsch in the year 1657. He described it as a kind of water-cistern about eight feet in length, four in height, and two in width; and as being drawn by two horses, on a sledge ten feet long and four broad: it was worked by twenty-eight men; and a stream of water an inch in diameter could be thus forced to a height of eighty feet. Hautsch distributed engravings of his engine in different towns of Germany, and offered to construct similar machines for public use. This engine appears to have been

but little else than a forcing-pump, or perhaps a suction-pump and a forcing-pump combined. The difference between these two forms of pump may be exemplified by the common squirt or syringe. This is a tube in which a piston works tolerably water-tight: the lower end of the tube is narrowed to a small aperture; and when this end is immersed in water, and the piston drawn up by means of its handle, a vacuum is produced in the lower part of the tube on account of the impossibility of air gaining access to it: water immediately ascends into the tube to fill up the vacuum, and thus the supply is obtained. So far the instrument is what is termed a suction or sucking pump, and nearly corresponds in principle with the common household pump: we may here remark that the term *suction* gives a very erroneous idea of the action of such machines; since it seems to imply that the piston sucks or draws the water into the tube; whereas the water is pressed into it by the atmosphere from without. Supposing the squirt to be full of water, we transform its action to that of a forcing-pump, by pressing down the piston: the water, urged by this pressure, escapes from the lower aperture; and as this aperture is purposely made very small, the water issues from it with a force which carries it to a great distance. Such is the philosophy of a boy's squirt, and such appears to have been nearly the principle of Hautsch's fire-engine:—the piston was moved by twenty-eight persons instead of one; the aperture was an inch in diameter instead of being capillary; and the extent to which the stream was forced exceeded eighty feet.

But such an instrument was deficient in two notable appendages, which distinguish the fire-engines of modern times: these were, the air-chamber and the flexible hose or pipes. We may again make use of a squirt to illustrate what is meant by an air-chamber. The water can be propelled from the squirt only while the piston is being moved one way; but if we could manage to have a separate chamber or tube filled with air, and this air could be constantly kept under pressure, this pressure might be made a moving force to propel the water from the tube in which the piston works. Such is the case in the modern fire-engine: the handles at which the men work elevate and depress the piston alternately, and if there were no air-chamber the water would issue only by spirts, and not in a regular stream; but by an ingenious adaptation of valves, &c., the water in the engine is constantly pressed upon by condensed air, which, striving to regain its original bulk, continually presses the water towards the place of exit.

It is remarkable that the inventor of this improvement on the fire-engine is unknown. A figure and description of a fire-engine with an air-chamber was given by Perrault in a work published in 1684: he described it as having been kept in the king's library at Paris; that it threw out water to a great height; and that the stream was in one continued jet: but the name of the inventor of the machine was not mentioned. We may remark, however, that the experiments of Mariotte and others on the air-pump were very likely to have led to such a result as this.

The useful invention of the flexible leathern hose attached to the pipe of the engine, was due to the Van der Heydens of Amsterdam. These persons were inspectors of the apparatus for extinguishing fires at Amsterdam; and their first experiments on the flexible hose were made in 1672. The use of these pipes will easily be understood, since they enable the water to be carried through tortuous passages, and to spots totally inaccessible to the engine itself. The success of the new method was great, and the inventors obtained an exclusive privilege for making the machines for twenty-five years: they also published a work descriptive of their new engines; this work contained nineteen plates, seven of which represent conflagrations which had taken place in Amsterdam, and at which the old engines were used; and twelve plates representing other fires at which the new engines had been successfully employed. These two persons also invented the method of filling the engine by pumping the water up from a well or reservoir through a stiff pipe, having at the extremity a metal strainer, pierced with holes, to prevent the admission of dirt: these feeding-pipes they called *wasserschlange* (water-snakes), and in some cases conveyed water to the engine from a distance of a thousand feet.

The improved engines, provided both with an air-chamber and with flexible hose, appear to have been first made for sale by Leupold, who published a work concerning them in 1720. His engines consisted principally of a strong copper box, closely shut and well soldered; it was very light and small, and capable of being worked by a small moving-power.

At what time these Dutch and German engines were employed in England does not clearly appear; but it may be presumed that each improvement, when its excellence had been tested by experience, was made known in England, and that the skill of our artisans gradually extended these improvements. About a century ago, Mr. Newsham was the principal London maker; and from that time to the present a constant train of improvements has been in progress, a detail of which would almost fill a volume. These improvements have had relation to the facility of working an engine,—to the quantity of water capable of being propelled by it,—to the readiest mode of supplying the engine with water,—and, in short, to every branch of the subject. Mr. Tilley has constructed fire-engines made wholly or almost wholly of metal; Mr. Braithwaite has succeeded in applying steam-power to the working of an engine; some engines have been so constructed as to be kept constantly afloat; while others again have been made in a compact form, to be kept for the protection of private mansions or large public buildings.

The subject of insurance from fire we need not here enter upon, further than to say, that it is a kind of compact among a great number of persons mutually to share each other's losses by fire, and that the medium through which this compact is made is the Insurance Company; but we may make a few observations on the Fire-engine Establishments. Until within the last seven or eight years, each Insurance Company had its own engines and firemen, and it too often happened that the latter would decline to exert themselves at the suppression of a fire, unless the building, which was a prey to it, was insured in the office to which they belonged. This circumstance, coupled with some others, led to the formation of the London Fire Establishment, in which the firemen, forming a corps called the Fire Brigade, act upon a well-arranged and united system, which renders their exertions more effectual than if they acted from divided interests. This corps is under the direction of Mr. Braidwood, who has displayed considerable energy and skill at many of the destructive fires which have occurred in the metropolis during the last few years.

Captain Manby, who so favourably distinguished himself by his ingenious invention for saving the lives of shipwrecked persons, published a small pamphlet a few years ago, in which, among other suggestions for the prevention and extinction of fires, he proposes that the water employed for that purpose should contain a certain portion of potash. He says:—"When a small quantity of simple water is cast on materials in a state of violent combustion, the heat from the burnt surface soon causes it to evaporate into steam, and the materials thus extinguished again becoming dry from the radiation of the surrounding heat, readily ignite;" but that if pearlash or potash be added to the water, "when the water evaporates, a solid incrustation of the pearlash is left on the surface, which, by defending it from the influence of the air, prevents it

from burning and from communicating flame to the contiguous parts."

The same gentleman further proposed the use of portable cylindrical vessels filled with water containing potash. His object was, to prevent the rapid spread of a fire before the arrival of the engines, by having at hand vessels capable of being managed by one person, and provided with the means, by compressed air or otherwise, of forcing a narrow stream of water with considerable power against the burning substances.

Not a year passes without the promulgation of some new plan having for its object the diminution of calamities resulting from fire. But it is evident that the plans most worthy of further attention are those which relate to the construction of houses in such a manner as to be nearly fire-proof. If a fire could be prevented from spreading from room to room, the loss of property would be very inconsiderable, and the distressing sacrifice of human life less frequent.

SCHOOL-TEACHING IN THE UNITED STATES.

[From a Correspondent.]

It occasionally happens, in countries where the general habits, customs, usages, &c. assimilate pretty closely, that, in consequence of some change in the taste or feelings of the people, or from some peculiarity in the state or formation of society, we find that new and original modes of doing or performing what has been done and performed for centuries past, are hit upon, adopted, and finally become permanently established. Not that they invariably turn out real improvements upon the antient and original customs, but there is commonly something which recommends them to the taste, views, or convenience of those by whom they are adopted. Now in the United States of America, as well as in most of our adjacent colonies, one of those new fashions and features above alluded to, and which may now be considered as an established custom, is that of the business—if so I may designate it—of common school-teaching. I have made use of the term *common* because, in almost every section of the country where the inhabitants have become comparatively populous and the settlements permanent and established, for the most part there now are schools, seminaries, academies, or collegiate institutions, established and supported either by companies or private individuals —as mere matters of speculation—or else endowed with annual grants of money from the legislature under which they exist. In other and older-fashioned countries generally, school-masters are usually stationary characters, and not in the habit of making yearly excursions in search of employment, like some of our own mechanics when they are upon what they term the "tramp." It may be true that in the vicinity of our wealthy towns and cities there are teachers and professors of the various parts into which a liberal education is divided, who are in the habit of paying daily or periodical visits to the schools or seminaries situated in the district they reside in, and are designated, according to what they profess to teach, as writing-masters, music-masters, or teachers, &c., but such, properly speaking, cannot be considered regular and *bonâ fide* schoolmasters.

New settlements, in countries where the older settled parts have become so populous as to part with a portion of their increasing population, are mostly commenced, if not principally formed, by emigrants from the older settlements, but these first settlers rarely form either the most industrious or respectable portion of the community. Such being the case, it commonly follows that those who thus voluntarily undertake to act as pioneers are by no means a class of persons likely to furnish a supply of school-teachers ;* and if some of them were ever so competent, while the settlements are quite new and the settlers mostly poor, there is not much to be done in the way of school-teaching. In colonies where most part of the first settlers are directly from foreign countries, it generally happens that a portion, at least, of those settlers are persons possessed of considerable property, and therefore the better able to provide competent persons (should there any such happen to be had) to act as schoolmasters or teachers. It is therefore principally in the interior parts of the country, among settlements that are just rising into notice and importance, that we find this class of individuals, namely, itinerant school-teachers, in such general demand. However, among new settlements generally, the children, for the most part, that are not mere babes, can be usefully employed during the summer months, and hence there is no occasion for the assistance of a school-teacher at that season of the year. But when winter sets in, and the ground becomes buried in deep snow, there is then often a scarcity of employment, not only for the younger branches of the family, but even for the older, the more hardy and robust ; for, besides the necessary attendance upon farm-stock, and perhaps a little chopping of wood, the generality of the farmers find little or no employment. It has been stated, but I know not upon what authority, that one-half of all the young men who annually emigrate from the New England states, when they arrive in the distant new settlements, for a winter or two at the least become school-teachers. I am myself well aware that to a considerable extent something of the sort is the case, for a long acquaintance with new settlements has afforded me an opportunity of much personal observation.

In the Eastern or New England States, scholastic establishments are very numerous, and a common education is obtained cheaply ; hence few of the inhabitants—who are familiarly styled Yankees—are found destitute of learning, even among those who entertain neither wish nor prospect of ever turning it to any particular account. Many, however, no doubt have a future object in view, but the great mass of the rural population send their children to school to be instructed in reading, writing, and a little arithmetic, simply with a view of their being able to transact their own business in the ordinary routine of a farmer's life. But it frequently happens that there are young men who, when they grow up, entertain no strong partialities for hard work, and who "so scheme it," to make use of an expression of their own, to procure a livelihood in as easy a manner as possible. Among these are many of the individuals that belong to the class of itinerant school-teachers, and who, although they may find it convenient as well as necessary to make use of their axes during the summer months, when the more unpleasant season for out-door employment comes on, turn their attention to school-teaching. It is therefore the prevailing custom, in nearly all the new settlements, to build a school-house as soon as circumstances appear to render such a proceeding desirable ; and the plan they adopt is simple and inexpensive, for if all those who are interested in the undertaking assemble by appointment, in a very few hours a small building of unhewn logs may be erected, provided the logs have already been prepared for the purpose of being rolled together into the form of a rude building. The fitting up of the interior is attended with but little labour or expense ; for two or three slabs, with pieces of round saplings for a couple of feet at either end, answer the purpose of forms or benches ; while two other slabs or planks, placed a little sloping along each side of the room, serve as desks or tables for the children to place their copy-books and slates upon.

It rarely happens that the parties in want of a school teacher go to the expense of advertising, even where printers are to be met with and they have an opportunity of doing

* It may be observed that the word master is very rarely made use of among the American people—at least in the non-slave-holding states ; and hence they discard it in such old-fashioned compounds as school-master, dancing-master, &c.

so; since, before the period arrives for opening school, some of those who feel the most interested in the matter probably have been looking out a little for a likely person for a teacher, not only in the settlement to which they belong, but also in some of the adjoining ones. It has already been stated that young men from the New England states are mostly employed in this way, but it occasionally happens that female teachers are chosen to this office in preference to the other sex, but the term school-teacher is indiscriminately applied to both. One principal reason for engaging females is, that they may sometimes be hired at a lower rate, and as cheapness is often a matter more attended to than character or qualification, should there be more candidates than one, the cheapest usually has the preference. Even those who receive the highest rate of wages for teaching the common schools seldom receive any more, often not quite so much as they would expect if they were employed in ordinary farm labour. In one respect persons employed to cut down timber, or attend to ordinary farming business, are better off than those teachers, for it is the prevailing custom for a teacher to board and lodge during a proportionate period of his engagement, at every house from which one child or more than one is sent to him to be instructed. Thus, if forty scholars attend the school, and the teacher is engaged for twenty weeks, with every family sending a couple of children he will have to board and lodge a twentieth part of the term of his engagement; so that should the scholars be distributed among twenty or thirty families—a very probable case—the teacher will accordingly have to become an inmate for a brief period with the same number of families. This can scarcely be an agreeable regulation, one would imagine, even for a Yankee itinerant school-teacher; and what would appear greatly to add towards making the matter still more irksome and unpleasant, according to our old-fashioned English notions of such matters, many of the settlers' houses are but sorry habitations, and often at a considerable distance from the school-house. But I have been assured by both male and female teachers, that in thus being compelled to board from house to house consists one of the chief charms of their engagements; for the poorest families generally manage to provide "wholesome victuals and drink," as they express it, for so limited a period; and should the lodging not be altogether of the most comfortable order, a few nights soon slip over. It gives, say they, an opportunity of becoming acquainted with the inhabitants of the whole settlement, and puts them in possession of many a little secret and piece of scandal, with a variety of other little interesting matters peculiarly delightful to Yankee curiosity.

Nothing is more common than for a youth of eighteen or twenty years of age to leave his native place, somewhere in the Eastern states, early in the spring or summer, and proceed westward on a trip of speculation, getting jobs of work wherever he can, as he advances on his journey, until, by the approach of winter, he probably finds himself four or five hundred miles or more from the place he set out from, and in the possession of a few dollars more than he started with. If he has been brought up in any of the older settlements, he will probably engage to perform any sort of ordinary farm-labour; but if he belong to one of the newer settlements (and several such are still to be met with in some of the Eastern states), and is better acquainted with the use of the axe than any other implement, then he will endeavour to get employed in a little chopping. When he finds the year fast drawing towards a close, he begins to examine more particularly the condition of the settlements he may happen to pass through, in order to ascertain where there is a probability of his falling in with a spell of teaching; and should he make what he considers a favourable discovery, he endeavours to get a job of work in the vicinity, in order that he may become known to the inhabitants, before the school-meetings take place on the subject of hiring a teacher. Females, however, have not an opportunity of acting in a similar way; and where one of them is engaged in preference to a young man, it commonly happens that she is the friend or relative of one of the influential settlers, and may probably have been accustomed to a little teaching in one of the older states. But the chief consideration in her favour is her willingness to perform the duties of teacher at a lower rate than a male teacher could be hired for; but this, however, is not always the case. The ordinary rate of wages is from seven to nine dollars per month, with board and lodging; sometimes even a little less, but scarcely ever any more; and were we to consider the qualifications of the parties thus employed, the rate would not appear so very low.

There is another view which is frequently taken of this system of itinerant school-teaching, and with regard to which many consider it as one of the chief inducements with the young men to seek employment in this way, and numerous instances of events are constantly occurring that tend to establish a good foundation upon which to base such an opinion. What we here allude to is this,—the opportunity it affords of forming matrimonial engagements with such of the girls as may be considered the flower of the settlements. Indeed I have frequently heard it admitted that the school-teachers and the wandering Yankee pedlars were a greater terror to such mothers as did not wish to part with their daughters than all the young men belonging to their own neighbourhood. But the pedlars, too, sometimes take up the trade of school-teaching, when—what with their captivating small ware, their miraculous tales of love and wonder, and their general stock of flattery and falsehood—it cannot be considered very surprising that they should so often be found captivating the hearts of the settlers' daughters, particularly such as possess handsome persons and prosperous connections, to recommend them to the notice of these speculating adventurers.

Growth of the Vine in England.—It is not too much to assert that the surface of the walls of every cottage of a medium size that is applicable to the training of vines is capable of producing annually as many grapes as would be worth half the amount of its rental. Every square foot of the surface of a wall may, in a short space of time, be covered with bearing wood, sufficient to produce, on an average, a pound weight of grapes, and I have frequently grown double that quantity on a similar extent of surface. Nor must it be supposed that a single vine requires for its training a large portion of walling. That very common notion has, no doubt, arisen from the universally defective method of pruning and managing; whereby the wood is suffered, and indeed encouraged, to extend itself most disproportionately beyond the capability of its fruit-bearing powers. I scarcely ever allot more than from forty to fifty square feet of surface for one vine; and, unless the soil and situation be very superior indeed, a single vine will require a space of time, not less than twenty years at least, before it will possess a sufficient degree of strength to enable it to mature annually a greater quantity of grapes than can be trained on the last-mentioned extent of surface. On a wall only twenty-five inches in height, and eighteen feet in length, I have for years trained a vine that is a perfect picture of fertility, the whole surface of the wall being every year literally covered with fine grapes close down to the very stem of the plant. It will thus be seen that small detached portions and vacant spaces of the surface of walls, which in innumerable instances are deemed of no value, and are therefore neglected, may be turned to a most beneficial account.—*Cultivation of the Grape on Open Walls, by C. Hoare.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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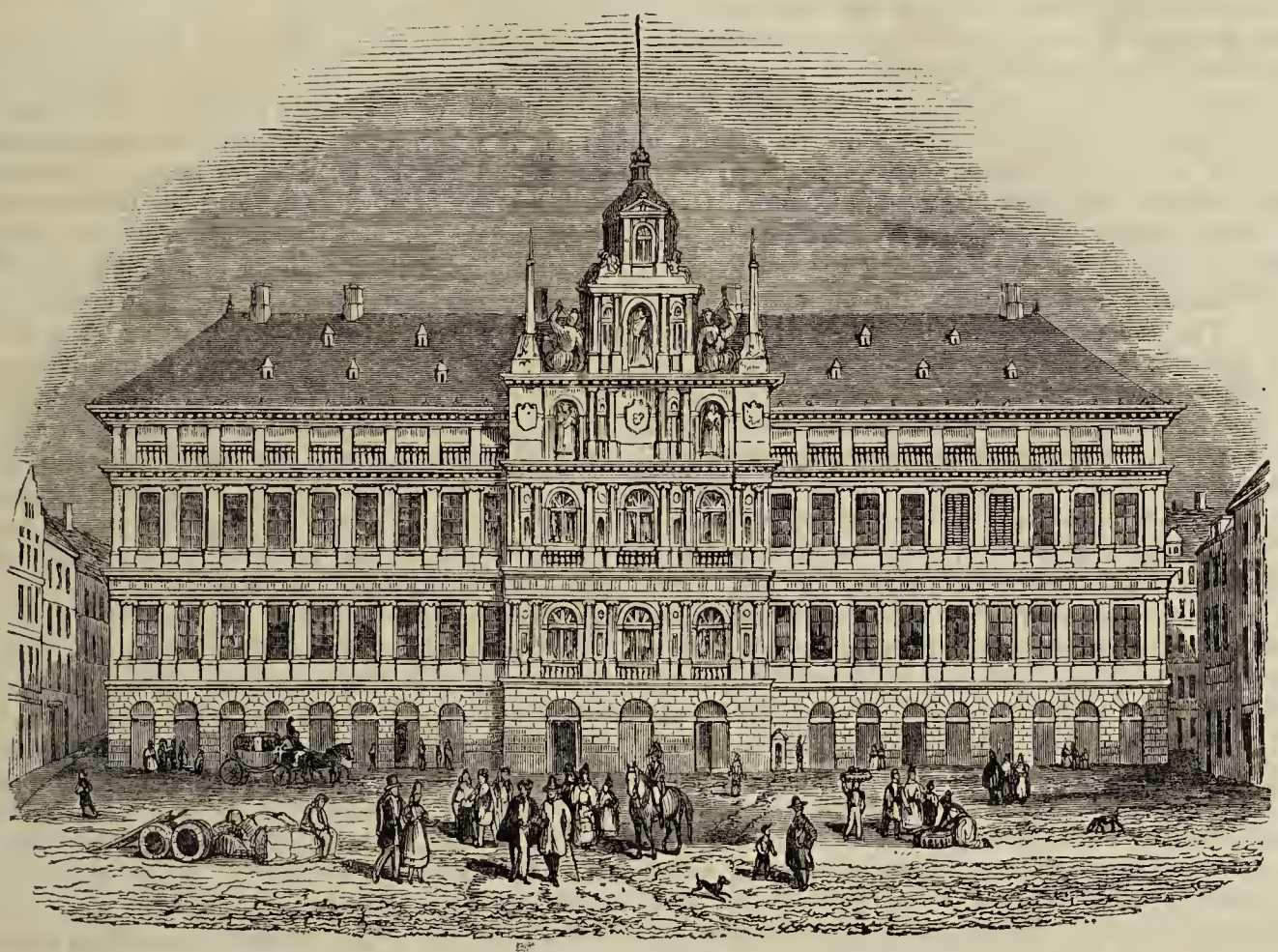

[Hôtel de Ville, Antwerp.]

BY means of steam-navigation, the voyage from London to Antwerp is often performed in twenty hours;* and once landed there, Belgium may be traversed in every direction with greater facility than any other part of Europe (England perhaps excepted), by means of the various lines of railroads which have been laid down within the last few years, and are now nearly all in complete operation. The tourist will find in nearly every large town of Belgium an edifice appropriated to the municipal body; and some of them, particularly those of Antwerp, Brussels, Louvain, Bruges, Ghent, and Ypres, are not only fine specimens of architecture, but are historically interesting from their connection with the progress of civilization. They are monuments only inferior in importance to the fine old Gothic structures which the piety of the middle ages erected for the purposes of religious worship; while the circumstances under which these municipal edifices arose are scarcely less inseparably connected with man's well-being.

A writer who laments the state of morals amidst a dense population, is obliged to confess that the growth of towns and cities is a change in society *essential* to the progress of the human race, to the advancement of manufactures and knowledge, national wealth and national power.† The principles of civil and religious liberty first germinated successfully amid cities; and they were necessarily the first seats of that opulence which softens men's manners and diffuses refinement as it advances.

During the early period of the middle ages, the feudal lord lived in his fortified castle surrounded by turbulent retainers, and the pedlers and mechanics who resided in the towns scarcely enjoyed any more independence than the serfs of the soil, being taxed and robbed at the will of their superiors. The weakness of the sovereign power at this period fortunately became a source of strength to the towns, and thus they arrived at liberty earlier than they would otherwise have done. The king was only perhaps a little more elevated in power and consequence above the other great possessors of the land, who constituted the aristocracy, and he granted privileges to the towns as a means of gaining the inhabitants to his interest. Corporate bodies, consisting of the principal townsmen, were constituted for the purpose of enabling them to manage their own affairs. In Italy these towns became little republics, because the sovereign was not strong enough to retain his influence over them; but in England and other parts of Europe, although they enjoyed considerable privileges, they were never independent. The fact of the large towns sending burgesses to parliament, or to the legislative bodies or states-general of different countries, is a proof of the importance which they had obtained. Acquiring thus a power which they exercised along with the aristocracy, they kept down the undue pretensions of one portion of the community, and facilitated the progress of juster ideas of man's equality. In 1120 a Flemish knight became degraded who married a woman belonging to the ranks of the people; but in 1300 the chiefs of the

* An account of Antwerp and of the cathedral will be found in No. 46 of the 'Penny Magazine;' No. 413 contains a notice of the commercial history of Antwerp; and No. 474 a general description of the city as it appears to the passing traveller.

† Southey, 'Life of Wesley,' vol. i., p. 328

gilden, or trades, were more powerful than the nobles; and nearly a century before, there was scarcely a man in a state of villanage in all Flanders. The thirteenth century indeed was an epoch in which the popular mind in the Low Countries began fully to comprehend the duties which men owed to each other as men, and they assailed with vigour and obstinacy those who were disposed to continue upon them a yoke which the change of circumstances had rendered intolerable. In 1257 the peasants of Holland and the burghers of Utrecht proclaimed freedom and equality, drove out the bishops and nobles, and commenced a struggle which lasted for two centuries. In 1303 Mechlin and Louvain expelled the patrician families. The inhabitants of the towns were become more numerous than the rural occupiers under the feudal lord; they were strongly imbued with the spirit of liberty; and a union of different towns rendered them not only powerful and formidable, but eventually successful in the objects for which they struggled.

During the period of these contests, the prosperity of the Low Countries was developed in an extraordinary manner. The towns became the great emporia of luxuries and the seats of flourishing manufactures; and wealth diffused itself and fertilised the face of the whole land. The establishment of manufactures was a most important step; it gave to the producers of agricultural and other raw produce the advantages of consumption on the spot, by which a great expense was saved in carriage. Instead of sending to a distant market so many quarters of corn or any other bulky commodity, it was much cheaper to export a piece of fine cloth, the manufacturers of which had consumed so much corn on the spot, which must have otherwise been exported instead of an article occupying a very trifling space. Manufactures also tended to overthrow the barbarous system of society founded upon physical power. When the great landholder could exchange the raw produce of his estate for luxuries, instead of its being consumed by tumultuous retainers, the latter were dismissed, and became peaceable tenants, artisans, and mechanics; the laws began to be more respected, and the indulgence of feuds between one great lord and another did not so certainly involve a whole district in disturbance and bloodshed.

The history of each of the town-halls of Belgium may be studied individually. They have each their story, all tending to the same result, but variously modified. The municipal fêtes given in the fifteenth and sixteenth centuries in these edifices were often extraordinary displays of wealth and abundance. On one occasion in the latter century, the town of Mechlin sent a deputation to Antwerp, consisting of three hundred and twenty-six horsemen dressed in velvet and satin with gold and silver ornaments; and a deputation at the same time from Brussels, consisting of three hundred and forty individuals, was equipped with equal splendour and accompanied by seven huge triumphal chariots and seventy-eight carriages variously constructed; and this, it will be recollected, was at a period when the carriages of the nobility in other countries were few in number and rude in design.

A glance at the cut will render a lengthened account of the town-hall of Antwerp unnecessary. The façade is nearly three hundred feet long, and its general appearance is striking and imposing. The central part of the building is fronted with marble and ornamented with statues. The Tuscan, Doric, Ionic, and Corinthian orders have each been successfully employed by the architect; and the edifice is regarded as the finest of the kind in Europe. The building of a town-hall was commenced in 1560, and was scarcely finished before it was burnt down, when the present structure was raised upon its ruins. In 1713 the town council pulled down twenty-nine houses which surrounded the hall, but the space in which it stands appears still rather confined.

HORSE ARMOURY IN THE TOWER.—X.

Francis Hastings, Earl of Huntingdon, A.D. 1555, Robert Dudley, Earl of Leicester, 1560.

The figure of Francis Hastings, second earl of Huntingdon (who succeeded to the title in 1544, and died in 1560), serves to continue in chronological order the series of armour, by presenting us with a suit of the time of Mary, in whose reign, however, no particular alterations were effected in this part of costume. The armour in which the figure is clothed is a suit of plate, richly gilt, and in good preservation.

The armour of the Earl of Leicester affords us a splendid example of the knightly costume of the commencement of Elizabeth's reign. The gilding with which it was formerly covered has nearly disappeared; but his initials, R. D., and his badge of the ragged staff, with the collar of the Order of the Garter, the figure of St. Michael, &c., may still be perceived on many parts of the armour. In consequence of a proclamation issued in Mary's reign, forbidding the people to wear the preposterously wide-toed shoes which were then fashionable, peaked or pointed toes came again into vogue; and the sollerets of the armour, following the fashion set by the shoes of the civilians, became of a similar form. One of the earliest specimens of the peaked solleret of Elizabeth's time appears in this suit of the Earl of Leicester's. It was in this reign that the knights appear to have first perceived that many parts of their armour were better dispensed with, since the defence afforded by them did not compensate for the loss of power and exertion which their weight and cumbrous form occasioned. Accordingly it was only in tournaments and on occasions of display that the armour covered the whole body; in battle and in ordinary circumstances it did not descend much below the hips, the thighs being defended in a considerable degree by the large trunk-hose then worn. The Earl of Leicester's suit is, however, complete, and was probably worn by him in one of those gorgeous fêtes in which the nobles of Elizabeth's court competed with each other to dazzle the eyes of their mistress by brilliant deeds of arms, and by still more brilliant apparel and appointments.

Of the fortunate leader of these sports, the unworthy favourite of a queen who has been described as the wisest monarch of her time, we would fain speak with temper, but his vices were so apparent, and he was so utterly deficient of any good qualities that might hide by their brightness the corrupting glare of his baser nature, that we shudder when we write his name, and wonder how historians can record the favours conferred upon him by the queen, and in the same page hold her up to the admiration of posterity as the paragon of regal perfection. Scott, in his novel of 'Kenilworth,' has made his nature sufficiently hateful, although, by a means excusable in works of that nature, he has thrown the odium of his principal guilt on his creature Varney; yet in that work, bad as he is represented, he is not shown as the monster which history, with a too faithful pencil, has pourtrayed him, for succeeding generations to turn from with loathing. The death of his first wife, Amy Robsart, whose gentle nature is so delicately drawn by Scott, is not the only damning deed laid to his charge: his second countess had nearly shared the fate of poor Amy, and the secret cup of poison is more than suspected to have been administered in other cases.

Although so undeserving the favour in which he was held by his sovereign, and the influence he exercised over all parties in the state, has rendered his name more prominent than that of many others of less note who better deserved his good fortune.

Robert Dudley was the fifth son of John Dudley, Duke of Northumberland, and was born in or about the year 1532. His father procured for him, in 1551, the post of one of the six gentlemen of the bedchamber to Edward

VI., and, about the same time, that of master of the king's buck-hounds. By his address and his ready flattery, he soon found himself one of the most familiar of Edward's companions, with whom he was a great favourite till his death. On the accession of Mary, he became implicated in the charge preferred against his father, of attempting to place the Lady Jane Grey on the throne; but professing great attachment to Mary, at the same time that he pleaded guilty to the charge, he suffered imprisonment for a short time *pro forma*, and was then taken into the queen's favour. By attaching himself to Philip, the queen's husband, he was enabled to assist many of his friends who had been concerned in the affair for which his father suffered. At this time too he was enabled to mitigate the severity of the Princess Elizabeth's confinement; and it is probably to the impression he made on the mind of the young and deserted princess that his future advancement was owing. On the accession of Elizabeth, he was appointed master of the horse; and shortly after, on the 4th of June, 1559, he was installed knight of the Garter, and sworn of the privy council. These great preferments were followed by grants of estates to an immense value, among which were the manor and castle of Kenilworth. On the 29th September, 1564, he was created Earl of Leicester.

At this time Leicester had aspired to the hand of the queen, who appeared to encourage him, and had even, to show she considered him equal to a royal alliance, proposed him to Mary, Queen of Scots, by whom she knew he would be rejected. But Elizabeth entering into a treaty of marriage with the Archduke Charles of Austria, which had every appearance of sincerity, the proud hopes of Leicester were damped. The opposition which he gave to the negotiation offended the queen, and the appearance of her displeasure induced several to appear more openly as his enemies. But it was only on this subject that the queen expressed any anger; and when Leicester dropped his opposition as the best means of stopping the treaty, the queen's favour seemed to have increased.

It was at about this period that his conduct to the Duke of Norfolk occasioned the disgust of all men, though they dared not express their feelings. Having avowed the greatest friendship for the duke, he wound himself into his confidence, professed to aid him in his project of marrying the Queen of Scots, indeed did in fact assist him in his plans, and then, when the duke was on the point of openly avowing his intentions, he betrayed the whole to the queen, and, at the trial of the duke, he procured his death by the production of men whom he had employed during his professed friendship as agents in the prosecution of the plans for the marriage. Having compassed the destruction of the Duke of Norfolk, he exerted himself secretly against his friends Lord Burghley and Sir Nicholas Throgmorton, though to them he appeared to behave with the utmost kindness and cordiality; for at the very time when his party were framing a regular accusation against Burghley to the privy council, he was addressing letters to him (which letters are still extant) stuffed full of the most fulsome flattery and professions of the warmest friendship. Against Sir Nicholas Throgmorton he employed measures of a more speedy kind. It has been strongly suspected that, in order to rid himself of this gentleman, who, possessing much of his correspondence, was a dangerous person in his way, he had recourse to the poison which he had found successful in other cases. Sir Nicholas Throgmorton, being on a visit to the earl's house, died suddenly after partaking of a supper to which he had been invited; and though it was said to have been an attack of pleurisy, violent suspicions were entertained that some deleterious matter had been secretly administered to him. Indeed practices of this nature were so generally ascribed to the earl, that it was currently reported he kept a Jew and an Italian in his establishment, who were adepts in the art of preparing the means by which to carry off his enemies. The queen was almost the only person who ventured to defend him from such suspicions, and indeed he appeared to increase in her esteem the more the blackness of his character became apparent. In July, 1575, the queen visited him at his princely castle of Kenilworth, where she remained for the space of nineteen days, being entertained by him with the utmost magnificence.

In the year 1585, Leicester was placed in command of the expedition sent to assist the United Provinces, but this appointment only served to evince the shallowness of his resources in cases of difficulty. Being totally deficient in military experience, he found himself opposed to the Prince of Parma, one of the first generals of the age, who so effectually thwarted his designs, that his service in the Low Countries was only marked by misfortune and disgrace. He was finally recalled in 1587, and arrived just in time to prevent a charge prepared against him of mal-administration in the Low Countries from taking effect.

Notwithstanding, however, his want of success in this expedition, he did not lose the favour of Elizabeth, who shielded him from the attacks of her ministers, and raised him to the highest pinnacle of fortune and power which a subject could attain. Elizabeth could refuse him nothing, and her ministers, even Burghley himself, seem to have trembled at his nod. All the most important commands, civil and military, in the nation, were in the hands of relatives and friends; and to the offices already held by himself were now added those of steward of the household, chief justice of the forests south of Trent, and, in the summer of 1588, the command of the army raised to prevent the Spanish invasion. But in the midst of his success, Leicester, having left London for a short sojourn at Kenilworth, stopped on his way thither at his house at Cornbury, in Oxfordshire, where he was seized with a rapid fever, and died, September 4, 1588.

In his private life he was as little esteemed as in his public character he was detested. In 1550, at the age of eighteen, he married Anne, or Amy, daughter and heir of Sir John Robsart, a gentleman of Norfolk, in which county he possessed estates of considerable value. He lived with this lady for the space of ten years, whether happily or not we have no means of knowing; but at the end of that time, and at the very period when nothing appeared to him to oppose itself to a marriage with the queen but the fact of his being already married, the Lady Amy suddenly died in a very mysterious manner, and with too much probability of her death having been caused by her husband. He had removed her to Cumnor Hall, a house in Berkshire, in the possession of a man named Anthony Forster, by whom, with the assistance of a creature of the earl's, Sir Richard Varney, she is supposed to have been murdered. They had sent all the servants to Abingdon fair, and in their absence proceeded to carry their horrible plans into effect. They are supposed to have gained admittance to her room by a secret door behind the bed, and, having deprived her of life, to have laid the body, shockingly disfigured, at the foot of the stairs, where it was found by the servants on their return. It was given out that she had died from the effects of a fall, but the body was hastily interred, and a coroner's inquest avoided.

The inhabitants of the neighbourhood were so impressed with the idea that her death had been caused by foul means, that they one and all joined in a memorial to the queen begging for an inquiry. No notice was, however, taken of the request, and the murderers, for such there is little doubt they were, were suffered to escape the punishment they deserved; though their names have ever since been held up to merited infamy in the legends of the place, and in the ballads and tales to which it has given

rise. Many a fair eye has wept over the beautiful ballad of 'Cumnor Hall,' by which Mickle gained an immortality at once for himself and for his story, and none ever rose from a perusal of Scott's 'Kenilworth' without shuddering at the villainy of the earl and his base associates, or bewailing the fate of his innocent victim.

Leicester, however, appears to have felt no remorse, since we find him in other cases pursuing the same courses with the same unblushing wickedness. After many intrigues, which we need not dwell upon, he attached himself to Douglas, daughter of William Howard, first Lord Effingham, and widow of Lord Sheffield. With this lady he contracted a secret marriage, having previously, it has been supposed, caused the death of her husband by poison; but he never publicly acknowledged the marriage, and when, some time after, his thoughts were directed to another channel, he caused her by threats and violence to disown the connection by taking as her husband Sir Edward Stafford. However, in the prosecution of a suit afterwards instituted in the Star Chamber to establish the legitimacy of her son by Leicester, the marriage was proved by respectable witnesses; and the means adopted by the earl to induce her to give her hand to Stafford, and thus disavow her marriage, fully detailed by herself on oath. She swore that besides using threats and personal violence, he had attempted to remove her by administering poison, under the operation of which her hair and nails had fallen off, her constitution had been utterly ruined, and her life only saved by the promptitude of her physician.

That such a man should have been able to blind the eyes of the queen to his vices, at the time when every one else in the empire was aware how perfectly despicable his character really was—"proud, insolent, interested, ambitious; without honour, without generosity, without humanity"*—only proves that, neglecting useful and honourable studies, he had made himself a perfect adept in the arts of cunning and dissimulation.

"He seems not," says Lodge, "to have possessed a single virtue, nor was he highly distinguished by the qualities of his understanding; but the unlimited favour of Elizabeth, which for many years rendered him the most powerful subject in the world, invested him with a factitious importance; while, on his part, by a degree of hypocrisy so daring that it rather confounded than deceived the minds of men, he contrived to avoid open censure. Even flattery, however, seems to have been ashamed to raise her voice for him while he lived, and the calm and patient research of after-times, with all its habitual respect for the memory of the illustrious dead, has busied itself in vain to find a bright spot on his character.

Supplemental Plan for rendering Children at Day-Schools instrumental in extending Knowledge and Instruction at their Homes.—I have lately seen a plan adopted, which I think likely to prove useful, and well calculated to counteract, in a measure, the disadvantages to which boys at day-schools are exposed from the indifferent characters of many of their parents. A supply of cards is provided, containing each one short text, proverb, or short fact in geography, natural history, natural philosophy, or domestic economy; and I think that short spelling-lessons and easy lessons in language might be included. A different card is lent to each child every evening, to be brought back the next morning, when some account of its contents is required. Great advantage might accrue from thus enabling our poorer families to accumulate, as it were by morsels, accurate information on various subjects. I am persuaded that the parents, on meeting their children after the day's work, would soon become as anxious to inquire about the evening's lesson as the children would be to exhibit it. The proverb, or text, or fact, would often be the means of enlivening their frugal meal by the rational conversation arising out of it. Thus the suitableness of the moral lesson to the peculiar circumstances of the family might afford great though indirect benefit. At the same time, the facts relating to heat, the properties of substances, &c., would awaken intelligent interests either in the ordinary domestic operations or in the employment of the family.—*Mrs. Tuckfield's Letters to a Clergyman.*

* Hume.

The Eider-Duck in Iceland.—The whole of the hill to the west of the house was strewn with nests of ducks. So much do these interesting birds feel their security in Vidoe, that five of them had chosen as their location the ground under a narrow bench that runs along the windows of the house; and so perfectly fearless were they, that, without moving away, they would peck at the hand that disturbed them. The rising ground is particularly favourable for the birds to build on, being covered with hollows and inequalities, that serve to protect them from the weather, and only require the addition of down to convert them into nests. The drakes are easily known by their white and black plumage; but the dark hue of the females makes it difficult to distinguish them from the holes in which they sit. Owing to their lying close, I have frequently trodden on them, without their warning me of their presence till the mischief was done. The drakes, though by no means wild, will not allow themselves to be handled so freely as the ducks, and mostly keep together on the top of the hill. As soon as a nest is completed, it is usual to remove the greater part of the down, while the bird is away feeding; and this operation is repeated a second, and occasionally a third time. On her return, the bird makes up the deficiency thus created by stripping her own breast; and, when her stock is exhausted, she calls on her mate to add his portion, which will bear no comparison with the sacrifice she has made. The same sort of spoliation is practised with regard to the eggs, care being taken that three or four are left; for should the bird on her return find the nest empty, she will desert it, and not breed again the same season. About six, considerably larger than those of tame ducks, and of a light green colour, are found in each nest. Their flavour is very inferior to that of hens' eggs, but they are not so strong as to prevent their being made into omelettes. The average quantity of down obtained from three nests is half a pound, so mixed with grass and foreign matter, that forty pounds in that state are reduced to fifteen, after it has been thoroughly cleaned. Vidoe and Engoe together produce, I believe, about three hundred pounds weight yearly; which would, if the above calculation is correct, make the number of ducks that come to these two places fall not far short of ten thousand every year. The number, however, that breed in Faxèfiord is small compared to those that bend their course to Breidèfiord. The innumerable little islands that fill that bay afford ample shelter and security to eider-ducks, who seem to avoid nothing so much as any place accessible to foxes. These cunning animals are particularly fond of their eggs; but, though we will give them all credit for ingenuity in getting at them, we can hardly be expected to put much faith in the story told about them by the Danish travellers, Olavson and Paulson. When, say they, the Icelandic foxes have detected any crows' eggs in an inaccessible place, they take one another's tails in their mouths, and form a string of sufficient length to reach the nest, and let one end of it over the rock. They have, however, forgotten to tell us how the eggs are passed up by these craftiest of Reynards. The separation of the down from the grosser feathers and straws occupies the women during winter. It is then thoroughly divested of particles too minute for the hand to remove, by being heated in pans, and winnowed like wheat. Should it become matted and dead, it is again subjected to a brisk heat, which restores its original elasticity, and increases its bulk. As in the case of ostriches, the down taken after death is inferior to that which the living duck tears from its breast, which prevents their destruction through wantonness. They are besides protected by the law, which punishes the shooting of them by a pecuniary penalty and the forfeiture of the weapon used. Nor are guns allowed to be fired in the neighbourhood during their sojourn; and even the corvette that brought the prince abstained in the spring from saluting him.—*Winter in Iceland and Lapland; by the Hon. Arthur Dillon.*

CARNBRE CASTLE, CORNWALL.

[Carnbrê Castle.]

This singular fortress is situated in the parish of Illogan, about ten miles from Truro, and seldom has a wilder or more savage looking spot been chosen for such a purpose. Its foundation is a great mass of rocks, irregularly heaped up on the eastern side of a lofty hill, the entire summit of which is strewed over with what Borlase, the historian of Cornwall, considers to be Druidical remains, comprising "rock basins, circles, stones erect, remains of cromlêhs, carns, &c." Later writers, however, seem to think that the circles, stones erect, and cromlêhs existed only in the antiquary's vivid imagination, and that the rock basins and carns are natural products.

The castle is of an irregular shape, and very small, being scarcely sixty feet long and about ten wide. Only a portion of the original building exists, which is easily recognised by its rude masonry. The walls are everywhere pierced with small holes for the discharge of missiles, and for the purposes of observation. Only one of the three stories of which the castle consisted is now kept in repair. The room called the parlour is floored with one great flat rock, having in its surface a regular elliptical hollow, or basin. Stones of this kind, the "rock basins" of Borlase, are found in every part of the hill. There were at one period some buildings attached to the north-west end of the castle, forming its outworks; these have long since disappeared. The earliest historical notice of Carnbrê Castle is found in the writings of William of Worcester; he mentions it in his 'Itinerary,' written during the reign of Edward IV., as belonging to Sir John Basset, knight. "This was certainly," says Borlase, "a British building, and erected in those uncultivated ages when such rocky hideous situations were the choice of warlike, rough, and stern minds."

About three hundred yards from the castle, on the highest part of the hill, which is six hundred and ninety-seven feet above the level of the sea, is a circular fortification, which appears to have been originally surrounded by a stone wall of considerable height and strength, as the piece yet remaining, about twenty feet wide, testifies. It is called the old castle. Extending from and partly including this fortification, Borlase professes to trace another, with a part of its mound or earthen wall still remaining on the south: this he looks upon as the sacred place set apart by the Druids for the performance of their chief offices.

In the middle of the ridge of the hill an immense number of gold coins were discovered in 1749, producing, when sold by weight, nearly 16*l*. A few days after, a similar treasure was discovered. The coins were evidently very ancient, were certainly neither Greek nor Roman, and Borlase at last arrives at the conclusion that they are British, and were coined before the invasion by Cæsar. The principal figure in them is that of the horse, which is constantly attended by a wheel, as an emblem of the chariot; in many a spear also is traceable, whilst in particular coins there are indications of a charioteer, a bridle, and a trailed or pendent weapon, which is perhaps a *scythe*. All these, Borlase thinks, are allusions to the skill of the British in chariot-fighting, on which they might reasonably pride themselves, Cæsar himself having noticed it with commendation. Brass Celtic and Roman coins have also been dug up in the neighbourhood.

Of the huge stones scattered about the hill, Borlase, in his 'History of Cornwall,' has formed a complete Druidical system. He has probably allowed his imagination to carry him too far, but we can scarcely agree with Lysons ('Magn. Brit.') and Britton ('Beauties of England and Wales') that it is all visionary. Even Lysons admits that it is not improbable but there was some small Druidic establishment here; an opinion, however, founded not so much upon the appearance of the stones of Carnbrê Hill, as upon the circumstance that a part of the brook which runs along at the bottom of the hill was antiently called Red or Ryd Drew, i.e., the Druid's ford.

SLEEP OF PLANTS

(From 'Flowers and their Associations,' by Ann Pratt.)

All blossoms, if we except the few which, like the evening primrose, are open during night, are more or less affected by what is termed the sleep of plants; and the leaves of leguminous plants, as the pea, the lupin, and the clover, experience it very sensibly. Pinnated leaves are more sensitive than any others. These are leaves, formed of a number of leaflets, growing on each side of one stalk, as in the tansy; and this plant will not only fold during darkness, but when the light is too powerful. . . . . The appearance presented by vegetation during night is not, however, seen so plainly in a plant standing alone, as when it occurs in groups. "Thus," says Professor Lindley, "plants of corn, in which there is very little indication of sleep when growing singly, exhibit this phenomenon very distinctly when observed in masses; their leaves becoming flaccid, and their ears drooping at night." When, by an eclipse of the sun, darkness is spread over the face of nature at an unusual time, not only do the birds, mistaking the veil for that of night, betake themselves to their accustomed repose, but flowers and leaves are affected by it. This was observable during the last eclipse, in the garden pheasant's-eye (Adónis autumnális). This flower, which usually closes for the night at four o'clock, folded up rapidly as the darkness occurred, which was some hours previous to its ordinary time of enfolding. On the other hand, if the light of a candle be admitted during night, they will be roused from their state of sleep, or they may be kept closed by preventing the admission of the dawn. Although it is very evident that this peculiarity of the vegetable world had been noticed occasionally in earlier years, yet to Linnæus we are indebted for the most valuable and accurate information on the subject. It had not previously occupied the attention of the careful botanist; and though Chaucer and Shakspere, and many others, had alluded to it, and many must have marked the flowers in their moonlight walks, and pondered over their changes, still little progress had been made in ascertaining the state of these facts. A circumstance which occurred in his own garden first led the Swedish naturalist to a series of investigations. A friend had sent him some seeds of a species of Lotus. The red flowers which sprung from them excited his admiration, and as his gardener was absent when they came in bloom, Linnæus, immediately upon his return, took him to the greenhouse to see this new floral treasure. It was evening, and with a lantern they proceeded to the spot; but what was the surprise and vexation of Linnæus at finding that his beautiful blossoms had quite disappeared! He concluded that they had been eaten by insects; but on returning the next morning to his greenhouse, he saw them in full beauty upon the same part of the plant on which he had left them the preceding day. Again in the evening he accompanied his gardener to visit the plants, and again the flowers were gone, while the next morning once more exhibited them in full glory. His gardener declared that his master must have mistaken, and that these could not be the same flowers, but must be fresh blossoms. Linnæus was too much of a philosopher to be satisfied with such an idle conclusion, and in the evening he examined the plant, carefully taking up leaf by leaf, until he discovered that the blossoms had been quite hidden by the drooping foliage. This lotus is a papilionaceous or butterfly-shaped flower, and he found, upon looking farther, that the lupins and the garden acacias, and peas, and many more flowers similarly shaped, were affected in nearly the same way by the influence of night. But absence of light is not the only cause of the folding up of flowers. Many, both cultivated and wild flowers, are closed by the middle of the day. The common goat's-beard is frequently called by country-people 'go-to-bed-at-noon,' and the little pimpernel is safely enclosed in its calyx by twelve o'clock, while many a handsome garden-flower shuts up during the afternoon. . . . . Linnæus's dial of flowers, by which the time was shown by the opening or folding of blossoms throughout the day, has always been interesting to lovers of gardens. . . . . But that this poetical invention did not originate in Linnæus, we learn from a passage taken from Marvell's poem of 'The Garden:'—

> "How well the skilful gardener drew,
> Of flowers and herbs, this dial new!
> Where, from above, the milder sun,
> Does through a fragrant Zodiac run,
> And, as it works, the industrious bee
> Computes its time as well as we.
> How could such sweet and wholesome hours
> Be reckoned but with herbs and flowers!"

In the 'Encyclopædia of Gardening,' Mr. Loudon has given a list of well-known flowers, with their respective periods of unfolding and folding in this climate, for the purpose of assisting those to the selection of suitable materials who may wish to form a floral dial. The list is subjoined, as taken from that work, and the English names of the flowers are added:—

Time of folding and unfolding of the following Flowers.

		H.	M.	H.	M.
Goat's-beard	Tragopógon luteum . .	*3	5	†9	10
Late-flowering Dandelion	Leóntodon serótinum . .	4	0	12	1
Hawkweed Picris	Pícris echioides . . .	4	5	12	0
Alpine Hawk's-beard	Crépis Alpína	4	5	12	0
Wild Succory	Cichórium íntybus . .	4	5	8	9
Naked-stalked Poppy	Papáver nudicaule . . .	5	0	7	0
Copper-coloured Day-lily	Hemerocállis fúlva . .	5	0	7	8
Smooth Sowthistle	Sonchus láevis	5	0	11	12
Blue-flowered Sowthistle	Sonchus Alpínus . . .	5	0	12	0
Field Bindweed	Convólvulus arvénsis . .	5	6	4	5
Common Nipplewort	Lapsána commúnis . .	5	6	10	0
Spotted Cat's-ear	Hypochæris maculáta .	6	7	4	5
White Water-lily	Nymphaéa álba . . .	7	0	5	0
Garden Lettuce	Lactúca satíva	7	0	10	0
African Marygold	Tagétes erécta	7	0	3	4
Mouse-ear Hawkweed	Hierácium pilosélla . .	8	0	2	0
Proliferous Pink	Diánthus prolíferus . .	8	0	1	0
Field Marigold	Caléndula arvénsis .	9	0	3	0
Purple Sandwort	Arenária purpúrea . . .	9	10	2	3
Creeping Mallow	Málva Caroliniána . .	9	10	12	1
Chickweed	Stellária média . . .	9	10	9	10

SKETCHES OF THE COASTS FROM SINCAPORE TO PEKIN.

III.—THE COASTS AND COMMERCE OF QUANG-TONG.

The southern coasts of China, lying between Hainan and Macao, are skirted by innumerable islands, the abode, sometimes, of peaceable fishermen, at others of pirates. An elongated point of land, stretching about sixty miles into the sea, is washed on the west by the Gulf of Tonquin, on the south by the narrow channel which constitutes Hainan an island, and on the east by the seas, properly called, of China. Near the centre of this promontory, and facing the rising sun, stands the city of Tong-tcheou-foo, on the most agreeable site west of Canton. It is the capital of a small district bearing the same name, and within its jurisdiction are many villages, entirely supported by fishing. The commerce carried on by this city is considerable, and it is besides often visited by some of the thousands of Chinese junks that pass yearly from Ho-po-so and Kong-tcheou-foo (two of the principal towns of Hainan) to Canton and the other ports of China. These vessels, besides bearing articles to exchange for the varied products of Hainan, are often crowded with passengers coming from the over-peopled province of Fokien. In the course of time this tide of emigration will doubtless overpower the stubbornness of the aboriginal inhabitants; but up to this day, as we have before remarked, the mountainous and central portions of the island are inhabited by a free race, while the plains are held by Chinese proprietors, to whom already numbers of the original race have submitted to become serfs. The head-dress of these natives is peculiar, their hair being collected into a ring in front, and then allowed to fall back from beneath their straw hats like a horse's mane over the shoulders. This is fashionable amongst both sexes, but the women in addition adorn their faces with regular streaks of azure. The men are lightly dressed, and are armed with a slight bow, in the use of which they are sufficiently awkward; but their principal and favourite weapon is a kind of cutlass, with which they not only

* Opens in the morning. † Shuts from noon to night.

clear themselves a way through jungle and underwood, but also perform many species of carpenter's work.

Among the rocks that surround this island certain beautiful blue fishes are sometimes to be seen swimming, which the Chinese would fain associate with their admired gold carp, but unfortunately they always die in a few days, if confined to the circumscribed limits of a pond. Were this not the case, they would doubtless, long ere now, have been made an object of commerce, like the spawn of the gold fish, which is collected into little jars, and carried through all the provinces for sale.*

Some distance up a river which disembogues itself half way between Louyt-tcheou-foo and Tien-pe-hien, but within the influence of the tide, is the town called Kao-tcheou, in the neighbourhood of which are dug those stones approaching in consistency to marble, and presenting, when sawn and polished, natural representations of a variety of landscapes—mountains, plains, forests, and rivers—which are cut by the Chinese into thin leaves, and used to veneer tables and other articles of furniture. In this district, as well as round Tchao-king-foo, are found an abundance of majestic peacocks, wild and tame, for which Quang-tong province is famous throughout China; from thence they are carried as objects of commerce to all other parts of the empire.

But the city of most note between Hainan and Macao is Tien-pe-hien, or Tien-pak, famous for its extensive salt-works and the great commerce in that article it carries on with Canton, whence several hundred junks come annually for the purposes of trade. Salt, indeed (one of the principal sources of the emperor's revenue), is to the Chinese more absolutely necessary perhaps than to any other nation, though even in Europe it has been placed† next to the philosopher's stone. The reason is apparent to any one acquainted with Chinese manners and customs, and who is aware of the vast consumption of fish and pork by the lower orders, to whom the flesh of any other animal (except rats ‡ and such-like rodent creatures) is almost unknown. The salt-pans on this coast, generally situated in the midst of marshes, are laid out in plots, some fifty feet square, and paved with small red stones, which imparts to them an air of elegance as well as of cleanliness and propriety. The margins are slightly elevated, and the water is either introduced by stream or pumped up by the method used commonly in irrigation. The salt, when collected and enclosed in bags, is piled in vast stacks, sometimes extending to a length of six hundred feet and averaging fourteen thousand bags to each stack. In the metropolis of Chen-si a very white salt, used universally by the poorer people to season their meat, is extracted, by boiling, from a species of earth. There are also in the other provinces bordering on Tartary mines of rock-salt, without which this article would be out of the reach of most men, since, although the salt is transported from the sea-shore to a reasonable distance inland, yet the expense would preclude it from being carried, for example, to Chen-si, except as a luxury. Thither, however, great barrels full of salt-fish from the coast are sent along the rivers and canals.

The coasts, and islands, and rivers of Canton province, in common with those of the rest of the empire, are inhabited by tribes of fishermen, and might have been expected, under other institutions, to have become the nurseries of a hardy race of mariners. But although, as will be seen, they have sometimes degenerated into pirates, China can scarcely ever be said to have had a fleet. Be this, however, as it may, within the limits of their calling they certainly exhibit an extraordinary degree of ingenuity and industry. To attest the latter, the entrance to the Canton river is crowded with fishing-stakes, and the well-known account of the fishing corvorants and trap-boats renders the former incontestible. The best edible member of the finny fraternity caught near Canton is the shell-pan, a species of rock-cod. The pomfret also is found, and sometimes, though rarely, the sturgeon, of which a stew is made, much esteemed both by natives and Europeans. Besides these, great quantities of shrimps, oysters, lobsters, crabs, and tortoises are caught, the latter chiefly prized for their shells, in which the Chinese work very curiously. There are likewise pearl-fisheries at some points on the coast.

The province is diversified with hill and dale; in some places it is dry and rugged, in others low and marshy. In the latter the rice grows, and those osiers with which the cordage of the junks is chiefly made. On the coast, but especially among the rocks near Macao, is found a sea-weed (*Fucus Saccharinus*), which enters into the materia culinaria. Having first been well soaked in fresh water, it is hung up to dry, after which it is boiled a certain time, and acquires, on cooling, the consistency of a jelly. Thus prepared it is used with several kinds of fruit to form conserves. It is also much eaten in Japan, and similar contrivances are resorted to in Iceland, Scotland, and even on some of our English shores.* In Japan the leaf, glued to paper, is edged with gold or silver thread, and is used as a plate whereon to offer gifts on occasions of ceremony.

Besides the fruits peculiar to China, the Lichi, the Loong-yen, or "dragon's eye," the Loquat, and the Wampee, with the common Oriental fruits, such as bananas, pine-apples, oranges, and citrons, the mango is also grown and ripens, though the fruit is small and of an inferior quality, and the blossoms sometimes do not produce fruit. Pomegranates, pears, chestnuts, peaches, and prunes are likewise found, though, from some quality in the soil, they rarely ripen, but are exceedingly good in preserves, the sugar for which is abundant in the province. Here also the camphor-tree (*Laurus Camphora*) grows to a height of fifty feet, with a vast trunk and wide-spreading branches; the fir-tree is planted, as in Japan, on the ridges of mountains, for fuel; and ornamental woods, such as ebony, eagle, and iron wood (used also by the Chinese for their anchors), are abundant. The minerals, metals, &c. are mercury, gold, copper, iron, pewter, and saltpetre. Some precious stones are also found.

The inhabitants of Canton are very clever imitators in hardware, and their works are not without their value, though at Peking they are held in but little estimation, because they are slight, and labour is generally sparingly bestowed. The silk stuffs, on the contrary, there manufactured are much sought after, especially that kind besprinkled with flowers and open like lace.

This city, situated at the bottom of a deep gulf almost entirely choaked up by an archipelago of islands, is, as is well known, the centre of all European commerce with China. It is not our intention, however, to enter into any minute description of it, which would be superfluous, considering the number of very accurate accounts which are before the public; nor of Macao, that colony having been already described in this Magazine. Our intention is simply to present the reader with a sketch of the

* The gentry at Batavia keep several species of fish in vases, for their amusement. They spend a great deal of time in observing the mode in which these fish lie in wait for insects and catch them with their tongues.

† By Sir William Monson, in his 'Naval Tracts.'

‡ These rats are caught at night, along the banks of rivers, by means of a lantern, which, being held to their holes, brings them out to reconnoitre, when they are easily taken. In Japan rats are taught to perform a variety of tricks to amuse the people.

* In Von Troil's 'Letters on Iceland' the following passage occurs. Enumerating the articles of food used by the Icelanders, he mentions, among others, "Flour of Fiálgrás (rock-grass, *Lichen Islandicus*), a cask of which, well cleaned and packed, is worth a rix-dollar. It is first washed, and then cut into small pieces by some, though the greater number dry it by fire or the sun; then put into a bag, in which it is well beaten, and lastly worked into flour by stamping." The reader will also call to mind the samphire, &c. used in Wales and other parts of Great Britain.

various approaches to the city and the principal islands that lie in the way.

In spite of the very intricate appearance the chart of the Canton river presents, the approach is generally exceedingly safe, as few or no hidden dangers exist. Sometimes indeed, if the pilot does not presently come aboard, ships push on without one through the nearest convenient channel for Macao roads, and accidents very rarely occur.

The island of Sanchuen, which is passed by ships bound for Macao on the south-east side, is not entirely desert, a few villages of fishermen being scattered here and there over it. Indeed the whole of the islands which lie at the mouth of the Canton river are the resort of innumerable fishing-boats, in which entire families are occupied at the nets. At night the lights placed at the stern of their boats to attract the fish afford a curious prospect, especially as they glance into some narrow strait, and light up the craggy sides with the red beams of their torches. All the season they spend thus pursuing their occupations; but when, by the warmth or coolness of the water, and by a variety of signs, they are warned of the approach of a typhoon, retiring into close creeks, they draw their boats ashore and patiently await the end of the storm.

Habit and curious observation have given to the Chinese boatmen and fishers a peculiar readiness in foreseeing the approach of the typhoons. They assert that when, from no apparent cause, the sea rolls in upon the beach with a long and heavy swell, the typhoon is certainly approaching. Another prognostic is that the atmosphere assumes a thick muddy appearance, and an unusual stir and disquiet are observable among the sea-birds, who rise on the wing and fly screaming about, as though to find a place of shelter from the coming tempest. Lightning too in the north is a threatening indication, but thunder generally precedes an abatement of the typhoon.

These tornados are not disastrous only to the fishermen and traders by sea, the husbandman also feels their pernicious effects. The hurricane, commencing in the north, gradually veers round to the east and south, and from thence comes charged with salt water, to wither and almost utterly destroy the vegetation near the coast. Trees are often rooted up or shattered, ships driven on the rocks, houses unroofed, and the innumerable rivers swollen into torrents, which pour destruction over the low rice-fields on their banks. So terrible indeed are these visitations, that the Chinese build temples to deprecate their fury; witness the lofty tower of the Thundering Winds, and the numerous edifices that line the rocky shores of the narrow strait between Hainan and the continent, in which, on the fifth day of the fifth moon, the magistrates offer costly sacrifices, burning fragrant woods, or scattering rich essences, and which seem placed there as guardians and protectors of the commerce unceasingly carried on below.

To return, however, towards Macao. We leave a vast range of mud flats on the left, and on the right the famous group of the Ladrones, the one called the Great, high and acuminated—the other less lofty but more level at top. These islands are bordered by rocks of a dark brown colour, much honey-combed by the constant action of the salt water: they are clay with a small proportion of calx of iron, and a considerable one of flinty earth and mica, a species of talc. The surface of the islands is covered with a soil which seems also to partake of the above-mentioned qualities. The springs there found are neither brackish nor chalybeate.

The general aspect of the rocks and small wave-washed plains that greet the traveller on his first approach to Canton river is anything but inviting. Throughout the greater portion of the year nudity prevails on all sides—broken shores, vast mud flats, and the bare scalps of numberless rocks afford little encouragement to the sailor to delay his approach to Macao island, where almost undying verdure prevails.

Turning to the west from Macao round Ko-ho point, the ships take their course for Typa harbour, towards which the tide flows at the rate of two miles and a half an hour. From the northern opening of this port Macao town, Tweelin Shan, or Catera island, and Low-chow-yaong, or Nine Islands (the resort of a peculiar species of pelican), are distinctly visible, whilst some pagodas and towers, dotting the low hills behind Macao, show that we are at length in China.

[To be continued.]

The amelioration of the condition of mankind, and the increase of human happiness, ought to be the leading objects of every political institution, and the aim of every individual, according to the measure of his power, in the situation he occupies.—*Hamilton's Progress of Society.*

Method of Treating Vines.—Every moderate-sized dwelling-house, having a garden and a little walling attached to it, may with ease be made to produce yearly a quarter of a ton weight of grapes, leaving a sufficient portion of its surface for the production of other fruit.....The grand parent error which prevails universally in the cultivation of the vine on open walls lies in the method of pruning usually adopted, and this is undoubtedly the consequence of the nature of the plant and its peculiar characteristics being in general but little understood. In the course of the growing season a vine in a healthy condition will make a quantity of bearing-wood sufficient to produce ten times as much fruit as it can bring to maturity. When this fact is considered in connection with another, namely, that the wood which bears fruit one year never bears any afterwards, and is therefore of no further use in that respect, it will easily be seen to what a surprising extent the pruning-knife must be used, to get rid of the superabundant wood which the plant annually produces. But nine parts out of ten of the current year's shoots, and all those of the preceding year, if possible, to be cut off and thrown away, is apparently so much beyond all reasonable proportion, and the rules usually observed in pruning other fruit-trees, that few persons ever possess the courage to attempt it: and herein, as remarked before, lies the capital error in the common method of managing the vine.—*Cultivation of the Vine on Open Walls, by Clement Hoare.*

Importance of comprehending the Meaning of Words.—The very limited vocabulary of the children of the poor, and their vague ideas of the very words they know and use, are the greatest impediments to improvement. Their strange mistaken apprehensions of the meaning of the simplest terms is well known to those who are practically engaged in the education of the lower orders. It is certainly of the first importance to give the habit of never using a word without being able to attach a precise meaning to it. The importance of such a habit to *intellectual* progress is evident; but perhaps its tendency, in a moral point of view, has not been sufficiently observed upon. It seems to me that there are numberless ill effects on the human character arising from the use of vague and undefined terms; that it engenders self-deception and presumption; that it undermines an early love of truth and all aptitude for accurate research. On the other hand, the habit of attaching clear ideas to every expression seems to me to engender a taste for truth, a taste for research, and an experimental conviction that nothing is satisfactory and delightful but what we can apprehend clearly ourselves and communicate distinctly to others. The clear apprehension of ideas of course facilitates the ready habit of clear and candid expression of thought and feeling; and I cannot help suspecting that the habit of accurately defining words, and of never passing over one not defined, has had a strong, however indirect, influence in the formation of those characters which are remarkable for truth and candour.—*Mrs. Tuckfield's Letters to a Clergyman.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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BRITISH AGRICULTURE.

JULY.

[Saxon Agricultural Emblems for July.—From Cotton MS., Claudius, B. 5; and Lansdowne MSS., 381 and 383, in British Museum.]

In introducing the subject of hay and hay-making, we shall offer a few observations upon the irrigation of meadow or grass lands; for we have often borne witness to the indifferent management of farmers in this respect, indeed quite as much so as anything we remember to have noticed in arable farming.

It must be understood, that when we speak of irrigation, we refer exclusively to old grass-lands; for as regards what are termed artificial grasses—from their not being indigenous to our soils in general, and from their being for the most part cultivated upon arable lands, where they are sown along with corn-crops, and afterwards allowed to stand for one, two, or more years—there is not so much danger of any extraordinary mismanagement. It is a well-ascertained fact, that upon most meadow-land, irrigation, where it is practicable, is one of the simplest and cheapest modes of improving grass-crops; but partly owing to its principle not being generally understood, and partly where adopted not being properly attended to, much less benefit is derived from the system of watering grass-lands than might reasonably be expected. Ignorance, we believe, has much to do with the bad management we allude to; for we have met with many a farmer possessed of a tolerable share of general intelligence respecting agricultural affairs, who seemed not to be aware that water, pure and simple water, constitutes so necessary and material an item in the food of most sort of grasses and common plants. The drainage of the farm-yard or dunghill they seem to consider as beneficial to grass, because they naturally partake of the nature of the substances they come in contact with; but how simple water can be fertilising, they appear not to entertain the remotest idea. But water, when applied to meadow-lands, like the wholesome drug of the apothecary in complaints incident to the human frame, may be administered in too copious doses; for where a moderate quantity would produce the desired effect, too large an application would have an opposite tendency. Thus it is with many meadows that are laid under water (or flooded) the whole winter, or over which copious streams are allowed to flow for several months in succession; for the effect of such a long immersion is certain destruction to many of the better and finer qualities of grass; and should their places be at all supplied with other plants, they are sure to be of a coarse and inferior description. Indeed it often happens that the entire crop of grass treated in this manner will be rather diminished than increased in quantity, and the quality is certain to be greatly deteriorated: an occasional overflowing would have produced the wished-for result, for the crop would have been increased without its quality being at all impaired. Regarding

springs and small streams, how often do we see them allowed to meander in devious shallow channels, or mere ditches, from meadow to pasture, and from hill to dale, without a drop of their water being turned to a profitable account, notwithstanding field after field might have been irrigated at a trifling outlay of labour or expense. On the contrary, we have witnessed the most insignificant (in regard to size) runs of water conveyed with great care from a considerable distance, for the sake of making their waters available to the purposes of irrigation. Where the situation is favourable, that is, a moderate slope or descent in the surface, it is really surprising to witness the considerable extent of ground that the smallest runnel may be made to water, by a judicious opening of slight artificial trenches in sundry directions, so that every part of the meadow may, in due succession, share the benefit of the enlivening and fertilising influence. Among the ancients it seems to have been the practice to irrigate their corn-fields. Pliny observes, that in a particular district where it was practised, the water destroyed the weeds and nourished the corn. When the Persians were masters of a considerable part of the adjacent countries, they permitted those who conveyed a spring of water to any place which had not been watered before, to enjoy the benefit for five generations. Virgil, in his 3rd 'Eclogue,' refers to the irrigation of meadows; and in the 'Georgics,' book i., he says:—

"Why sing of him, who, when he drops the grain,
Pursues the ridges of the sandy plain:
The water then entices from its bed,
While rills in trickles follow as they're led:
And when the ground its scorched condition shows,
Its herbage withering while the summer glows;
Lo! from the brow of some declining hill,
He draws in streams the gentle-winding rill."

The hay-harvest, or season of hay-making, is, amongst the various occupations of the husbandman, the period which excites the most general interest throughout the whole country. Neither seed-time, the turnip-season, nor even the corn-harvest itself, is by any means so general and common to every district; for the traveller may visit many parts of the country where not a furrow is turned up by the plough upon scores of small grass-farms in immediate connection with one another, where, as a natural consequence, there can be neither seed-time nor corn-harvest: but in respect to hay and hay-making, the case is different; for notwithstanding there may occasionally be found arable farmers who cut but very little grass, yet, under the improved system of farming, where the artificial grasses have their places assigned them in the rotation of crops, most of the farmers make (at the least) as much hay as is necessary for the consumption of their own farm-stock. Such being the case, hay-making is a more general business, while it lasts, with the whole agricultural community, than any other whatever; and although the mere operation of cutting down the grass, and afterwards making it into hay, would seem to be a matter so common and simple, it is a little curious to find the inhabitants of different parts of the country using different sorts of implements and adopting contrary processes to those that are practised elsewhere. This, however, should be understood as applying more particularly to old meadow or natural grasses: as regards new or artificial grasses, a more general plan seems to have been adopted; for since their nature and properties have been carefully examined into, in order to ascertain their respective values to the agriculturist, the best period for cutting them when intended for hay, and the process best adapted for curing the hay under ordinary circumstances, have now been pretty generally determined and acquiesced in.

Soil, situation, and climate, undoubtedly, have a very considerable influence in bringing the farmer's crops to maturity, and yet the period at which our grass-crops should be submitted to the scythe seems to be regulated by various and conflicting opinions; for even in some of the midland counties, including a portion of "the sunny south," we find the meadows remaining uncut at a period when the more northerly and bleak districts of country are busily engaged in securing their crops of hay. The present month, however, taken generally, may be considered as the busiest time of hay-making; for while in warm and forward situations we find much of the artificial grasses, as well as the old meadows too, cut and sometimes carried during the latter part of June, yet, even should the weather prove favourable at that early season for hay-making, the greater bulk of the crop is usually carried to the stack or mow during the month of July.

In the grazing and dairying districts, where the farm-stock is wholly, or nearly so, subsisted upon hay, and where the crops of grass are commonly heavy, a vast deal of labour is necessarily devoted to this object; for with several additional hands to those ordinarily employed upon the farm, even should the weather prove as favourable as may generally be expected, four, five, or six weeks are often consumed before the hay-harvest is fully completed. In some of our mountain and dale districts, when the summer proves rainy and unsettled, the small farmers, who do not incur much extra expense in wages, may frequently be seen engaged in hay-making so late in the season as the month of September. On the whole, however, they are often losers by making hay so out of season; for although the grass that has remained uncut until it is old and sapless may not require so much labour in the curing, in quality it is hardly superior to straw; and besides the ground being greatly impoverished by permitting the plants to mature their seed, there is no second crop to afford pasture for milch-cows and other cattle during the latter part of autumn, when the summer pastures have become exhausted; besides which, from the general want of covering, should the winter prove severe, the future crops will in some measure be injuriously affected. Notwithstanding the practice is so frequently departed from, there seems no doubt that to cut the grass before it ripens its seed is by far the better and more profitable plan; and in most cases a little extra outlay in wages would be advisable among those farmers who are mostly in the habit of only employing their own families during "hay-time," which, with them, signifies a term of indefinite length; for should the season prove unfavourable, from their being able to turn out only a small force on favourable days, or portions of days, they are less able to take advantage of short gleams of sunshine; the grass is consequently longer exposed to the rains and dews before it is made into hay, and thereby greatly injured in quality; and should there be other necessary farm-labour requiring the husbandman's care and attention, the protracted term for securing his hay often causes serious neglect somewhere. Tusser, whose ideas in most matters of this sort are remarkably correct, thus introduces the subject of hay-making:—

"Go, muster thy servants, be captain thyself,
Providing them weapon, and other like pelf;
Get bottles and wallets, keep field in the heat,
The fear is as much as the danger is great.

With tossing and raking, and setting on cocks,
Grass lately in swathes is hay for an ox;
That done, go and cart it, and have it away,
The battle is fought, ye have gotten the day."*

Hay which is intended to be fed to cattle or sheep may be gathered in somewhat earlier than that intended for horses, for should it get a little hotter than desirable in the stack or mow, and become partially what is termed mow-burnt, it is not the less acceptable to them; for the slight fermentation that takes place by a moderate overheating produces a sweetness that they seem to relish: but when intended for horses, it cannot be too thoroughly

* 'July's Husbandry.'

cured before it is brought from the field. If, however, it should be collected into large quantities before the juices are tolerably dried up, or with a portion of rain-water amongst it, there will be danger of its taking fire in the mow, or of its becoming mouldy and rank in flavour.

Hay-making is one of the few out-door employments that, in most parts of the country, we still find females taking a part in; and which, if they are to be employed abroad at all, the cleanly and wholesome nature of this occupation renders it above all others the fittest for their lending their assistance. But some of the operations attending hay-making are of the severest kind, and never attempted by females or children: of these may be mentioned mowing, and forking or pitching the hay when cured, both to the cart and the mow; while other parts of hay-making (except where the grass is very heavy) are considered such mere "child's play," that we frequently see boys and girls engaged in the hay-field, with their small and light rakes, assisting those who are willing to take upon themselves the more laborious parts of the work.

Amongst all our artificial grasses, saintfoin, formerly called holy-hay, is probably the earliest fit for the scythe, for upon many soils it is allowed to be a little earlier than lucern, or any of the trefoils or clovers. As its cultivation, however, is rather partial than general, this sort of grass can hardly be considered among our common sorts of grasses designed for hay. Saintfoin hay, as well as that made where clover forms a prominent part, has to undergo a different process from the common meadow hay. Hay of this sort, after being cut, is allowed to remain undisturbed in the swath for at the least three or four days, when it is gently turned over in order that the other side may wither and dry for a short time. Should the weather prove rainy after such grass is cut, it may prove necessary to turn it oftener than once, but as the leaves are apt to crumble and break off when dry, by which means the finest and best part of the crop is lost, great care is necessary in mowing it; and for the most part it is never spread abroad, or raked together and made into cocks, like meadow hay; but as soon as it is sufficiently dry and withered, it is carted to the stack or barn, and there carefully deposited.

We will not attempt to detail the various processes adopted throughout the country in converting the grass upon old meadows into hay, for the size and fashion of the implements in use are scarcely in two counties precisely the same. When the crop of grass is heavy, it usually takes about three fine days to dry it sufficiently, by being spread abroad and subjected to the action of the sun and air on each day; and where large quantities have to be collected into one stack or mow, after the crop has become tolerably well withered and dried, it is then made into large cocks and permitted to remain unmolested for several days before it is carted to the stack-yard. In some situations, particularly where the country is hilly, we find sledges employed in carrying the hay to the stack; while elsewhere "sweeps," as they are called, are used in preference to sledges or wheel-carriages in removing the hay from the field to the stack. Sweeps are commonly of very simple construction, being nothing more than two pieces of timber of eight or ten feet in length, curving a little inwards, and connected together by several upright bars of about five feet in height. The hay having been raked together into bulky rows, the sweep, with one or two horses attached to each end of it, is applied to the most distant part of the row, when the boys who ride the horses have to be careful to manage them so that neither end of the sweep gets in advance of the other, for if so, the bulk of the hay would not become collected, as the horses advance, in equal quantities along the whole length of this upright and curved hurdle. Having collected as much in front of the sweep as the horses can draw, the postillions drive off to the place of deposit, and having delivered their cargo without a minute's delay, away they gallop back for another sweep-load.

One of the old modes of destroying weeds, as well as of increasing the fertility of the soil, but which is at present but little practised in comparison with what it was formerly—is that of paring and burning, or burn-baking, as a process of this sort is named in some parts of the country. Previous to the present various kinds of manure becoming so generally in use—partly owing to the wretched condition of most country roads, and the impracticability of cheap and easy conveyance, and partly to the then indifferent system of farming—paring and burning was very much in fashion, not only on moory, waste, and such soils as were overrun with weeds and rubbish that were otherwise exceedingly difficult to subdue, but even upon almost every description of land, without almost any reference to the quantity or quality of the soil, a portion of which by this process became reduced to ashes, and was for ever lost in a great measure, however inconveniently or disadvantageously a portion of it could be spared. Tenant-farmers, to be sure, who occupied their farms upon short leases, or held them from year to year, seem to have been the only individuals who could with any degree of plausibility adopt a practice that must in the end, according to the very nature of things, prove ultimately injurious to all such lands as already possessed but a scanty soil; for persons the most prejudiced in favour of the paring and burning system could not but admit that at each time the surface of the soil was pared off, either by the paring-spade or paring-plough, and afterwards reduced to ashes, that a portion of the surface soil, which is usually of the best quality, was necessarily destroyed; for although the ashes might have the effect of acting favourably as a manure, and thereby the present crop would be increased, a few repetitions of the same thing must inevitably reduce the soil so materially, that in many cases little but the subsoil would be found remaining. In some situations, and under particular circumstances, however, the practice may be, and still is, pursued to advantage, even when the theory of cultivation is so much better understood, and when roads and water-communications have been so much extended and improved, that manures, of one sort or another, may be easily procured by the great body of agriculturists all over the kingdom.

But besides the object of fertilising the soil through the means of reducing a portion of it to ashes, another consideration, and certainly the more weighty one, was that of destroying the weeds, rubbish, &c., that, from various causes, had obtained possession of the surface of the ground to such a degree, that some extraordinary means had become necessary to eject them and reclaim the soil upon which they grew. In many such cases paring and burning was the process of all others the very best that could have been devised; and even at the present day is often adopted as being decidedly the best plan that can possibly be pursued.

In the West of England, particularly in Devonshire and Cornwall, burn-baking, often called Devonshiring, used to be very generally practised. But this operation is somewhat differently performed to paring and burning elsewhere,—for instead of a breast-plough, push-plough, or paring-spade, as the same implement is called in different parts of the country, a broad mattock or beating-axe is employed in paring off the surface. But previous to the operation of paring being performed, there or elsewhere, it is necessary that the land should be laid tolerably dry, and all stumps and large stones (if any) must be removed, as well as whatever else might obstruct or injure the implements used in pairing off the surface. Even where horse-power is used, and that more modern invention the paring-plough is employed instead of the

spade or the beating-axe, it cannot perform the work effectively where there are large stones, stumps, or roots to obstruct its course.

The operation of paring should be performed during spring,—but not before the ground has become consolidated, and vegetation has made some progress, in order that the parings (sods pared off the surface) should have attained a firm and tenacious consistency, so as not to crumble and fall asunder by any handling they may necessarily be subjected to prior to their being burned. Should the paring be performed during the winter season, or very early in the spring, they become so imbedded in the soil which their original surface comes in contact with, that in order to accomplish their drying during the early part of summer a vast deal of labour is commonly necessary. The paring-spade has a fly-wing, which rises about three inches in height, on the land side, and a wide socket into which a long flat handle is fixed, the upper end being mortised into a cross piece of timber about two feet in length. The man who performs this laborious operation has a small pad or cushion fastened against the lower part of his chest, on the front side of which is fixed a small forked piece of wood, with which he strikes or pushes against the cross part of the handle of the spade—bringing the whole weight of his body to force it forward, the cushion preventing the force of the blows from injuring his chest. The usual breadth of the spade is about twelve inches. When the ground is free from stones and other obstructions, so that he can keep the edge of his spade sharp and in good condition, at each push of his body he will probably be able to advance it six, eight, or ten inches—according to the nature of the soil and power of the stroke,—advancing his feet alternately, until the sod or paring be about two feet or two and a half feet long; when, by lifting the spade up on its edge, which he is enabled to do by means of the cross part of the handle acting as a lever—depressing one end with his left hand and elevating the other with his right, he manages to turn the paring over upon the grassy side, and in this manner he continues until he gets to the end of the piece of ground he may have marked out as "a land," returning to the place where he had commenced, so that the parings all lie in rows, like furrows turned one against the other in the ordinary mode of ploughing.

Moor-lands or waste-lands, or indeed commonly any other lands, are pared during the spring, and the sods, if possible, are reduced to ashes during June or the early part of the present month, in order that a turnip crop may be got in ere it be too late in the season. When the turf is coated with heath, moss, dead coarse grass, or any other rubbish, and the season proves tolerably dry, the parings are frequently burned off without even the trouble of turning them over, or using any other means to perfect their drying; but in wet seasons it is a very difficult matter to get them into a fit state for burning, and to effect this is sometimes quite impossible. When the sods become sufficiently dry, they are piled up in moderate sized heaps—the grassy side inwards, and as the fire consumes the inner portion of the piles, more sods are heaped on according to the force and rapidity with which the fires seem to burn. The heaps, however, ought not to be made too large, for the double convenience of not having the sods far to take when piling them up, nor the ashes far to remove when spreading them upon the ground, since they should be scattered equally over the entire surface. During the operation of burning, a constant attendance is absolutely necessary, in order to keep the fires going, and to get the fag-ends of the sods all completely reduced to ashes. As early as possible after this operation has been performed, the ashes should be spread over the surface, and immediately ploughed under, with as light a furrow as practicable; and after the harrows have partially broken up the furrows—without reducing the soil to a very fine tilth, the turnip-seed is sown broad-cast; and should the weeds, &c. that infested the soil have been wholly destroyed by thus paring off the surface, even upon light and very indifferent qualities of soil, large crops of turnips are often got without almost any further trouble. However, when the ground happens to be a portion of waste and almost worthless common, in addition to the ashes which may be made by burning off the sods, a moderate sprinkling of lime will be necessary in order to ensure a tolerably good crop.

When the paring-plough is used, after it has skimmed off an exceedingly thin furrow, the sods have to be cut across, either by a machine for that purpose, or by a sharp-edged spade. But the operation of cutting them into proper lengths, and the necessity of walking upon them, has the effect of pressing them closer to the damp soil on which they rest, than the sods which are pared with the paring-spade. The cost of paring may be calculated at from twelve to twenty shillings an acre, and the burning at eight or ten, though the latter is a matter of great uncertainty, so very much depends upon the state of the weather. Push-ploughing, or paring with the spade, is one of the most severe kinds of labour that the husbandman is occasionally subjected to; but since it requires some tact and adroitness, as well as great exertion, we seldom find farm-servants employed upon this sort of work, for the farmers find it more to their advantage to let paring out by the piece or the acre to those who understand it, rather than employ their ploughmen, carters, or herdsmen. Where the nature of the ground will admit of it, newly enclosed common or waste lands are first broken up by this system of paring and burning, in preference to any other mode of reclaiming such soils, and it is undoubtedly an excellent means of cleansing such lands from their wild and useless productions, provided the soil will admit of a portion of it being consumed in the burning. But even upon such soils as are of a nature and a depth that the reducing to ashes of a small portion, from time to time, could not possibly be attended with injurious consequences, paring and burning is now but seldom resorted to; for since most of the deep deposits of decayed vegetable matter rest upon a subsoil of clay, that article is therefore easily procured, and alone, or in connection with lime, forms so useful a manure, that when properly applied its beneficial effects extend to several succeeding crops.

In many parts of the country where the land is cold and clayey, and of a poor quality, it is customary for the farmers to dig up the soil upon the head-lands, and to enlarge the ditches adjoining the fences; and, taking advantage of some droughty spring or summer, pile the whole up in long heaps which they manage to reduce to ashes; and being afterwards spread over the adjoining lands (though such ashes contain but little salts or fertilising qualities), by being ploughed in and well mixed with the soil, for a time they undoubtedly improve its quality. It is a pretty general opinion that ashes, particularly such as contain much vegetable salts, ought to be spread upon the ground and mixed with the soil as quickly as possible after the burning has ceased; but if they are carefully piled up in compact heaps, as soon as the first rains fall a crust will be formed outside the heaps, which will completely protect the remainder for almost any length of time; so that should the sods not get burned off in due season for getting in a crop of turnips, the ashes will remain in this state uninjured until the wheat or other autumnal crops are ready to be committed to the soil.

Regarding ashes as a manure generally, the opinions of eminent agriculturists are so much at variance, that it still seems a matter of considerable doubt how far such opinions may be depended upon. Kirwan, in his 'Treatise on Manures,' observes, "that *burning* converts vegetables

and other roots into coal: to preserve this carbon a gradual smouldering fire is the best. The danger to be apprehended from this practice is the husbandman's not pursuing an ameliorating system of crops afterwards: the custom is a very ancient one, and even from the most depraved practice, the ground perhaps in no instance has become effete. There seems to be little doubt of its being the best mode of breaking up a rude untouched soil: care should be taken to penetrate sufficiently deep to destroy the long roots and fibres." In Italy and some other southern parts of Europe, the farmers, even to the present day, practise the ancient custom of burning the stubbles; a custom, however, which certainly indicates but an indifferent system of agriculture.

> "The peasant oft his barren field has turned,
> And, as he raised the turf, its surface burned,
> And to the stubbles spread the crackling fire,
> Which shrink to nothing ere the flames expire."*

Since experience in matters of this sort is usually considered the safest and best teacher, a few observations of our own, upon the subject of ashes when used as a manure, may not be considered as irrelevant to our subject. Turf or peat ashes, when applied in large quantities as a top-dressing for grain or grass crops during the spring, from their peculiar heating nature are frequently found acting injuriously; whereas the very same quality of ashes applied in moderate quantities to the same sort of crops is generally found to answer a very good purpose. When meadows are manured with ashes, the effect seems to depend, in some measure, upon the wet or dry state of the season which follows; for where the soil is naturally moist or inclined to wet, and a rainy summer follows the application of ashes in the spring, the quality of the herbage is often deteriorated, although the quantity may not be lessened, since dwarf rushes, wild-sorrel, and other plants of a worthless description are considerably increased; while if the ashes are applied to dry and warm soils, and the summer should prove droughty and warm, although the quality of the herbage may be improved, the quantity, in all probability, will scarcely if at all be increased. Coal-ashes are less effective than those produced by the burning of turf or peat; nor are soap-ashes, unless more lime than ordinary has been used in the soap-manufactory, now in much repute with the farming community. Soot is a far more valuable manure than any sort of ashes, since the same bulk of it contains a much greater quantity of those fertilising properties than exists in any description of ashes; but it is of a somewhat heating nature, and therefore has to be cautiously and judiciously applied. During the spring, should the weather be favourable, it may be advantageously used upon such young wheat crops as may have suffered from the effects of a hard winter; and when old meadow-lands become mossy and hide-bound, no manure answers a better purpose than soot when applied in moderate quantities. It possesses this advantage among others, that a small cart-load of twenty or thirty bushels will generally be found sufficient to manure an acre of ground, and will often be found to answer a better purpose than when a much greater quantity is used.

Cole or rape—or cole-seed or rape-seed, as a crop of this is often provincially called—is now but little cultivated as a general crop, in comparison to what it was a century ago; owing, in a great measure, to the more general introduction of other useful productions, but more particularly turnips, tares, or vetches, and those artificial grasses that are now raised as a supply of succulent food for farm stock at that season of the winter and spring when the natural grasses of our meadows and pastures afford but a poor pittance to milch-cows, ewes, and lambs, or fat stock generally. It is nevertheless cultivated by the farmers in some parts of the country, but generally more for the seed than as a green crop, although but few crops yield a larger quantity of green food than does a tolerably good one of cole or rape. When it is allowed to ripen its seed—which it commonly does in the early part of the present month (July)—the seed is thrashed out and sent to the rape-mill, where that coarse kind of oil called rape-oil is extracted from it, and the residue is put into moulds and made into those cakes called oil-cake, so much in use in many parts of the country among those who fatten considerable numbers of cattle. It may be remarked, however, that the beef of the cattle that partake largely of oil-cake is by no means of the finest quality, for besides the fat being of an oily nature, a somewhat strong and unpalatable flavour is imparted to the whole; but when given to farm stock in small quantities, the flesh of such cattle is not at all injured. This great consumption of oil-cake (a portion of which is, however, made from linseed) amongst the farmers, may fairly be taken as a proof of its high repute as an article for fattening stock, although but comparatively few individuals now-a-days devote their attention to its cultivation upon their own farms. But one great reason for this, and probably the chief one, is the moderate rate at which it can be purchased in almost any part of the kingdom, since vast quantities of this article are imported from some of our continental neighbours, where both land and labour are cheaper than they are in this country, and where the soil is favourable to its growth.

The most common season for sowing rape is during this month: if sown earlier, it is apt to run to seed before checked by winter frosts; and when put into the ground later, it does not yield so large or good a crop. The most indifferent portions of most farms where cole-seed is cultivated are selected for that purpose, and commonly those that are inclined to be moist and wet; for on a dry and sandy soil, without a liberal allowance of manure, which is rarely bestowed upon it, large crops are seldom raised, the tap-roots requiring a considerable depth of soil to strike into. Where paring and burning are still practised, rape is occasionally cultivated instead of turnips, particularly in those districts where the soil is of an indifferent quality. Since the drill husbandry has become so general, we now find some of the crops of rape cultivated in rows or drills; but upon moory or newly broken up land the broadcast system is still pursued, and apparently with advantage. The seed is small, and resembles that of turnips, as do the young plants for awhile after they first appear; but the roots are seldom found of a bulbous shape; and, where the situation will admit of it, they strike deeper into the ground than almost any other crop cultivated by the farmer: hence rape is generally considered a great impoverisher of the soil. The plants will bear moving very well, so that it is sometimes sown in beds, and afterwards transplanted out for a general crop.

In a deep and rich soil rape grows very rapidly and luxuriantly, where many of the plants will attain the height of three feet and upwards. The plants should have plenty of room in every direction, since they send forth a number of collateral branches, all of which throw out numerous blossoms, and afterwards bear seed. It is of so hardy a nature, that the severest winters we experience scarcely ever injure crops of rape. It is the common custom to turn in flocks of sheep among the rape during the winter months, by which means the entire crop is eaten down, and nothing remains visible but a few inches of the hard and fibrous stalks. However, with the earliest mild weather when winter breaks up, the remaining stumps begin to show new sprouts, though it usually happens that many of the stalks that have been much bruised and gnawed rot down to the surface, and never more shows signs of vegetation. When the crop is cut for soiling cattle, this does not happen; and where a full crop of seed is considered of the first importance (which undoubtedly is the case with rape crops generally), it

* Virgil: 'Georgics,' book i

sheep are allowed to eat of the crop, the bruised parts of the stalks should afterwards be cut away with a knife or other sharp instrument, in order to ensure the re-sprouting of the plants. By the beginning of June fields of rape which have been treated after this manner will be in full blossom; and a month or six weeks after, the seed will be ready to gather in. It is a well-ascertained fact that sheep will fatten quicker upon rape than upon common turnips, and that a very small quantity of hay is all they require while fed upon it. Mr. Baker, in an essay on the culture of rape or cole, makes use of the following remarks:—"Cole-seed is one of the most profitable common crops known in England, but not for feeding cattle, nor should I have conceived that any persons could have thought of comparing it with turnips in that light. The profit of the crop is the seed, which amounts to five times the value of any food for cattle that will ever be gained from it. . . . But if the plant be applied to the same use as turnips, and used at the same time, it is agreed throughout the kingdom that the culture is worthless, not producing near the quantity of food with that crop, nor paying in any respect so well." Mr. Young, after he had seen much of it cultivated in various parts of the country, and after trying several experiments upon his own farm, speaks of it as follows:—"Respecting the culture of cole-seed merely for food in April and May, that is, to succeed turnips, there is one strong reason against it, which is, its not producing a great weight of food per acre. I know, both from my own and others' experience, that the weight of food is trivial compared to that of turnips and cabbages, &c. I will venture to say not an eighth part, consequently much land must be appropriated to this use; and after the season in question, what quantity of barley or oats will be gained? The sowing will be in May: now it matters nothing to inquire into culture or any other circumstances; it is clear enough that the spring corn crop is ruined by late sowing. Hence arises the necessity of the spring food yielding a great quantity on a small space of land, that the farmer may experience this evil only in a small degree. Cabbages, which yield as much food on one acre as ever cole-seed will on six, appear to come infinitely nearer the wished-for mark."

The harvesting of a crop of rape-seed is one of the most curious and interesting scenes connected with the whole system of arable farming. When the seed is nearly ripe, the plants are carefully cut, and laid in heaps or "reaps," in a particular manner, where it is suffered to remain undisturbed until it is considered sufficiently ripe for the thrashing; for it sheds its seed so readily, that great care becomes necessary in order to avoid a considerable loss. This being the case, large cloths, especially for the purpose, are brought to some convenient part of the field where the thrashing is to take place—the usual size of a cloth for this purpose being about twenty yards long by eighteen wide: but to such as have never personally witnessed an operation of this sort, we fear that the limited space we may be able to devote to the subject will hardly be sufficient to render the matter perfectly intelligible. The cole-seed sale, as the thrashing out of the rape-seed is usually designated, is mostly performed by active persons, and such as perfectly understand the business: and should the weather prove fine—which is absolutely necessary for the proper performance of the business, a more lively and exciting scene can scarcely be witnessed, the performance being usually concluded by the party partaking of a good supper and plenty of strong beer.

The number of persons employed at one of these cole-seed sales (rape-thrashings) is about twenty: when the crop is a full one, seven gatherers are selected; but if it is but thin, nine or ten are required. Some of these are women, and often two or three of them stout boys or girls. Not being able to get their arms round the bundles or reaps, each gatherer uses a sickle to enable him to lift the bundles without crushing out the seed, and putting the sickle carefully under the heap of stalks as it lays upon the ground, and assisting to steady it with the other hand, it is lifted and gently deposited in the bearing-sheet, of which there are two belonging to a party of rape gatherers. Each of these is about ten feet long and seven wide, with hoops at each side, through which a light pole is put, and it is carried when filled to the thrashing-cloth by two men, who are called bearers. The bearers having deposited their burden, another man, called a layer-on, places the rape in rows across the main cloth for the thrashers, who are four in number, to operate upon; two of them standing on either side. While the thrashers, who ply their light flails briskly, are engaged in thrashing the first row on the floor or cloth, the layer-on deposits another row at a proper distance from the first, and when the second row has been thrashed once over, they turn to the first and thrash it over a second time. Having performed their parts, two other men, called shakers-off, follow the thrashers, the first of whom throws up the stalks or straw, and while it is up the other strikes it in order to dash out any seed which may still remain, being provided with peculiar shaped wooden forks for that express purpose: they then with their forks throw the straw over the bolster (as it is called) of the floor-cloth to a person whose business is to remove it, and who is named the sack or shake-straw. After the shakers-off follow two persons—one of them commonly a woman, who take off the pods, or "coshes," with rakes for that purpose—being named, according to their respective places on the cloth, the before and behind cavers. The behind caver must be a person both strong and active, in order that his duties may be performed effectively; for upon him the saving or throwing away of a good deal of seed depends. When the weather is favourable, and the crop a pretty good one, a party of this description, who well understand the business, will frequently thrash out a hundred bushels in the day; but fifty or sixty bushels may be considered a day's work where the crop is but an indifferent one, and where it does not thrash out easily. The seed is afterwards dressed or winnowed, and carted off to the granary or the oil-mill.

In many parts of the world the seasons are so regular, and the atmospheric changes so distinctly marked, that the inhabitants are able to calculate within a very few days when the periodical rains will commence and cease, and when the winds, that may have prevailed for several months, will veer around, or altogether cease blowing. Where the seasons are thus regularly established in their character, the cultivators of the soil must necessarily be the better able to make their calculations respecting the amount of labour to be performed before any stated period; and they must also know, that should they omit taking advantage of the proper season, they afterwards will have no chance of redeeming lost time. The humidity as well as the variableness of the climate of Great Britain has long been proverbial; but notwithstanding this state of uncertainty, and the natural sterility of the soil in many parts of the country,—capital, enterprise, industry, and perseverance have combined in raising our agricultural celebrity far beyond that of more favoured neighbouring nations, or, indeed, of any other country upon the face of the habitable globe. How patriotic and faithful is the poet's description when he says,—

> "England! . . . . . Though thy clime
> Be fickle, and thy year most part deform'd
> With dripping rains, or withered by a frost,
> I would not yet exchange thy sullen skies,
> And fields without a flower, for warmer France
> With all her vines; nor for Ausonia's groves
> Of golden fruitage, and her myrtle bowers."*

This peculiar changeableness and uncertainty respect-

* Cowper: 'The Task.'

ing the weather, and what another day may bring forth, strongly tend to render it almost necessary, or at least very desirable, for the husbandman to keep some account —some register in his memory or otherwise, of the state and character of the various past seasons, with their general effects upon crops and vegetable productions, as well as upon the state of the markets. It is only from past experience that the foundation of a thorough practical knowledge in farming matters, as well as in matters of business generally, can be laid. Such being the case, we do not know how we could devote a page or two of our present number to a better purpose than that of taking a retrospective notice of the past six months of the year; and we would suggest to those who feel an interest in agricultural affairs, that, at the expiration of each month, they should take the trouble to note in some memorandum-book a few of the most striking and influential features of the month, with the prospects and appearances of the various products of the country at the time; since by so doing, in after-years it will not only be amusing to refer and compare, but often prove advantageous to have such precedents of past years from which to draw deductions and inferences concerning the future.

January.—At the commencement of the year the country was still suffering from the effects of the long continued rains during the latter part of summer and the greater part of autumn; for there had been but little dry weather, with scarcely any frost, so that the lowlands and wet soils were still in such a condition as to prevent the work from being completed, which, in more favourable seasons, properly belonged to the autumnal quarter of the year. Except in very unfavourable situations the turnip-crop had not materially suffered, and upon the whole they stood tolerably through the month, though the season was a trying one for sheep, particularly in the low and marshy countries, where the loss was very considerable. Once or twice during the month appearances indicated the setting in of frost,—but although the clouds cleared away for a day or two, the wind veered back to the south and west, and brought a return of damp and gloomy weather. During the early part of the month, the cart and the plough were not in general use except upon upland farms and light and dry soils, so that the farmers were by no means ahead of their ordinary business at this season—so much having been left undone during the latter part of the year. By the end of the month, however, team-work had made considerable progress.

February.—In the early part of this month a seasonable and rather keen frost set in; and although it was neither of long continuance nor accompanied by a fall of snow, it answered the purpose of checking premature vegetation, of destroying vermin and reptiles that infest the fields and the gardens, and producing a beneficial effect upon such soils and substances as require the action of frost upon them in order to reduce them to the most favourable condition. In some situations, however, where the ground had not got dry and settled, the young wheats suffered to some extent, a misfortune which is always to be apprehended after a very rainy season. After the breaking up of the frost, the weather continued dry upon the whole, so that before the month was out the farmers had made such progress in their various labours, that there seldom has been a corresponding period in which farming business had progressed so rapidly. By the middle of the month, in favourable situations, the ground was in a condition to receive the seed; and when March came in, many of the early spring crops were already in the ground. From the 18th or 20th to the end of the month, the wind continued northerly and easterly, though by no means cold for the season.

March.—As February ended, so this month began, dry weather and easterly winds still prevailed; so that the land which had been flooded, or too wet to receive the crops of wheat in the autumn, were now in a condition to be sown with spring-wheat, barley, beans, peas, or whatever else was considered to best suit the views of the farmer. Indeed the soils in general became so dry, that it was a difficult matter to work the stiff clays; and as for March dust, which is said to be so invaluable to the agriculturist, it probably was never known to be more abundant. Although what still remained of the turnip crops when March came in was of no great extent, the steady fine weather, with but little rain or frost, was the means of their answering a better purpose than a much larger quantity is often known to do under less favourable circumstances. With the exception of two or three slight changes during a day or two, the whole month might be called dry; and during more than four-fifths of the time the wind was easterly inclining to the north. The dry state of the soil and the prevalence of easterly winds retarded vegetation, although neither winter nor spring grain suffered materially for want of rain. As the end of the month approached, the pastures and meadows, even in the warmest situations, had scarcely begun to look green; while the tares and early grasses that are looked forward to for supplying the place of turnips at this season, were, on the whole, in a rather backward state; and it became a general prognostic among the weather-wise farmers, that we should have a late spring.

April.—After this month came in, the dry weather still continued, and for some time the weather was rather cool for the season, slight frosts frequently occurring during the nights. As the month advanced some parts of the country were visited by partial rains,—and although the wind occasionally veered round to the west, it presently got back again to the north and east. By the middle of the month the weather had become more like June than April; for the sun shone clear and bright for many days in succession, and although the wind was rarely southerly, the power of the sun's rays became almost oppressively hot. Notwithstanding this, vegetation did not advance rapidly, owing to the remarkably dry state of the soil, and the general want of rain, for with the exception of a few slight or irregular showers, none had fallen for the last two or three months. The grain-crops, in many situations, began to lose their colour for want of rain; but on moist soils the thin wheat-crops now began to cover the ground much better than had been predicted; and what was somewhat remarkable, even on dry meadows and pastures, where the grass seemed to grow but slowly, there were no appearances of drought, or of the roots being in any degree affected. Never was there a more favourable season for getting the turnip and potato grounds into excellent order, and fallows in general were in a state of great forwardness before the month expired. In some parts of the country hay became scarce, and the consequence was, as is invariably the case, farm-stock was turned into the pastures to seek a maintenance long before the period they ought to have been. During the preceding month, a disorder among milch-cows had become pretty general, particularly in large dairies, which continued during the present month: in the metropolitan dairies there was so great a mortality among the cows, and falling off of milk, that it became difficult to meet the demand.

May.—When this month commenced the general prospects of the farmer were not upon the whole so favourable as so long a continuance of fine weather would naturally have led one to expect. It is true that a finer season for preparing for summer crops had never been known, but neither the winter nor spring crops were in that forward and flourishing condition that they frequently present at corresponding seasons of the year. However, all that appeared wanting was rain, accompanied with warm weather, and scarcely a week had elapsed before the light south-western breezes brought with them gentle and refreshing showers; and before the second week

had ended, the ground had everywhere been saturated with an abundance of rain. The progress of vegetation was never more rapid or remarkable, and it presently became quite evident that grass would be pretty abundant —and quickly too, for it now shot up apace. About the middle or somewhat later in the month, the weather became colder, and frost was apprehended, but, fortunately, neither the fruit-trees nor any other part of vegetation suffered in this way, for warm weather and fine showers presently followed. By the end of the month the early grasses were, many of them, nearly ready for the scythe; and the old meadows showed evident indications of early crops. The young potato crops, too, looked remarkably promising, and the Swedes were got in in good condition; so that when the month closed there was not any appearance of a failure among the whole range of farm produce. The wheat, which had suffered early in the season, continued to improve as the season advanced; and, with the exception of the hop districts, where the fly had made its appearance in many places upon the bines, the farming interest had nothing to complain of.

June.—This month had scarcely set in when the mower's scythe was already abroad in many of the southern counties, as well as in fertile and forward situations elsewhere,—even in many where the cutting of grass is seldom begun until the latter part of the month. Not only were the new lays generally attacked, but the old meadows were likewise entered upon. In the district surrounding the metropolis, as well as some others, the crops were found lighter than had been expected; for the month of May had been so remarkably favourable to vegetation, and the meadows had improved so rapidly, that heavy crops were naturally looked for. It would seem, however, that the previous long period of warm and dry weather had so effected the grass-plants, that when rains at last fell, the growth of them was so vigorous and rapid, that they shot up their seed stalks, and approached maturity earlier than had been anticipated, and before the finer species of grasses had made a corresponding progress and filled up the vacant spaces. In the West and North of England, but particularly in the latter, when June came in, the crops generally had scarcely ever been known in so forward and flourishing a condition; and what is but seldom the case—in the valleys of Cumberland and Westmoreland, and the vales of Durham and Northumberland, the crops were almost in as forward a state as in the counties of Middlesex, Essex, and Surrey; and it seems moreover that the grass there is realising all that the farmers had expected of it. Wherever the hay has been carried, as is the case in most of the forward districts, if the quantity has not been large, the quality will amply compensate the grower, since most of it has been got in in excellent condition; for until past the middle of the month, the weather was remarkably propitious for hay-making; and though it then became showery, and continued more or less so until near the end, as the greater portion of the rain fell during the nights, the hay was but little injured, and the work but slightly impeded.

Scarcely could there have been a finer season for the crops of grain, and arable crops generally; for the rains that occasionally fell—not in deluges, but in gentle showers, were precisely such as the farmer desired while his wheat and barley were earing, and his turnips just peeping above ground. It may be generally and fairly stated, that up to the present time the appearance of the country, in an agricultural sense, has but seldom been so favourable.

MONTHLY CALENDAR.—AUGUST—Eighth Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock bef. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m	m. s.	h. m.		h. m.	h. m.
1 S	214	Lammas Day.	4 25	5 59	7 46	3·6	8m 57	8a59
2 *Su*	215	7 *Sunday after Trinity.*	4 27	5 55	7 44	4·6	10 15	9 11
3 M	216	. . .	4 28	5 51	7 43	5·6	11 31	9 24
4 Tu	217	. . .	4 30	5 46	7 41	6·6	0a46	9 39
5 W	218	. . .	4 31	5 40	7 39	☽	2 1	9 58
6 Th	219	. . .	4 33	5 34	7 37	8·6	3 13	10 24
7 F	220	. . .	4 34	5 27	7 36	9·6	4 20	11 0
8 S	221	. . .	4 36	5 19	7 34	10·6	5 18	11 49
9 *Su*	222	8 *Sunday after Trinity.*	4 37	5 11	7 32	11·6	6 3	morn
10 M	223	. . . [end.	4 39	5 2	7 30	12·6	6 37	0 50.
11 Tu	224	Half-Quarter. Dog-days	4 41	4 53	7 28	13·6	7 2	2 0
12 W	225	Grouse Shooting begs.	4 42	4 43	7 26	14 6	7 20	3 16
13 Th	226	*Dow. Q. Adelaide b.* 1792	4 44	4 33	7 24	○	7 35	4 34
14 F	227	. . .	4 45	4 22	7 22	16·6	7 48	5 52
15 S	228	. . .	4 47	4 10	7 20	17·6	8 0	7 10
16 *Su*	229	9 *Sunday after Trinity.*	4 48	3 58	7 18	18·6	8 12	8 28
17 M	230	*Duchess of Kent b.* 1786	4 50	3 46	7 16	19·6	8 25	9 48
18 Tu	231	. . .	4 52	3 33	7 14	20·6	8 42	11 11
19 W	232	. . .	4 53	3 19	7 12	21·6	9 4	0a37
20 Th	233	. . .	4 55	3 5	7 10	☾	9 35	2 4
21 F	234	. . .	4 56	2 51	7 8	23·6	10 21	3 25
22 S	235	. . .	4 58	2 36	7 6	24·6	11 26	4 33
23 *Su*	236	10 *Sunday after Trinity.*	5 0	2 21	7 4	25·6	morn	5 23
24 M	237	*St. Bartholomew.*	5 1	2 5	7 2	26·6	0 46	5 57
25 Tu	238	. . .	5 3	1 49	7 0	27 6	2 15	6 21
26 W	239	. . .	5 4	1 32	6 58	28·6	3 44	6 39
27 Th	240	. . .	5 6	1 15	6 55	●	5 10	6 53
28 F	241	. . .	5 8	0 58	6 53	1·2	6 32	7 5
29 S	242	. . .	5 9	0 41	6 51	2 2	7 51	7 17
30 *Su*	243	11 *Sunday after Trinity.*	5 11	0 23	6 49	3·2	9 9	7 30
31 M	244	. . .	5 12	0 4	6 47	4·2	10 26	7 44

Meteorological Averages,

Barometer.	Ins.
Mean height	29·891
Highest .	30·260
Lowest .	29·350
Hygrometer.	°
Mean dew-point	55·3
Highest .	69
Lowest .	46
Mean dryness	6·3
Mean greatest do. of day	12·4
Greatest dryness	29
Thermometer.	
Mean temperature	61·6
Highest	82
Lowest .	41
Radiation.	
Mean great. of Sun	33·1
Greatest power	59
Mean cold of terrest.	5·2
Greatest ditto	12
—	Ins.
Mean qty. of rain	1·453
Mean of evap.	3·327

Table of the Winds.

	Days.	Dew-P.
N. .	1	55°·5
N.E. .	2¾	53
E. .	1½	55 ·5
S.E. .	3	60
S. .	2¼	63
S.W. .	6	58 ·5
W. .	11¼	55
N.W. .	3	53

SUNDAY LESSONS.

Aug.	MORNING.				
2	7 af. Trin.	2 Sam.	21	John	21
9	8 „	1 Kings	13	Acts	7
16	9 „	„	18	„	14
23	10 „	„	21	„	21
30	11 „	2 Kings	5	„	28

Aug.	EVENING.				
2	2 Samuel	24	..	Heb.	5
9	1 Kings	17	.. „		12
16	„	19	..	1 Peter	1
23	„	22	..	2 Peter	3
30	2 Kings	9	..	Jude	

THE MOON'S CHANGES.

First Quart. 5th day, 5h.14m. mn.
Full . . . 13th day, 7h.15m. mn.
Last Quart. 20th day, 0h.17m. aft.
New . . . 27th day, 6a.44m. mn.

Day of Mth.	Length of Day.	Day's decrease	Day break.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	
1	15 21	1 13	1 30	10 38	15′ 47″
6	15 4	1 30	1 50	10 18	15 48
11	14 47	1 47	2 8	9 59	15 49
16	14 30	2 4	2 24	9 42	15 50
21	14 12	2 22	2 39	9 25	15 50
26	13 54	2 40	2 52	9 10	15 51

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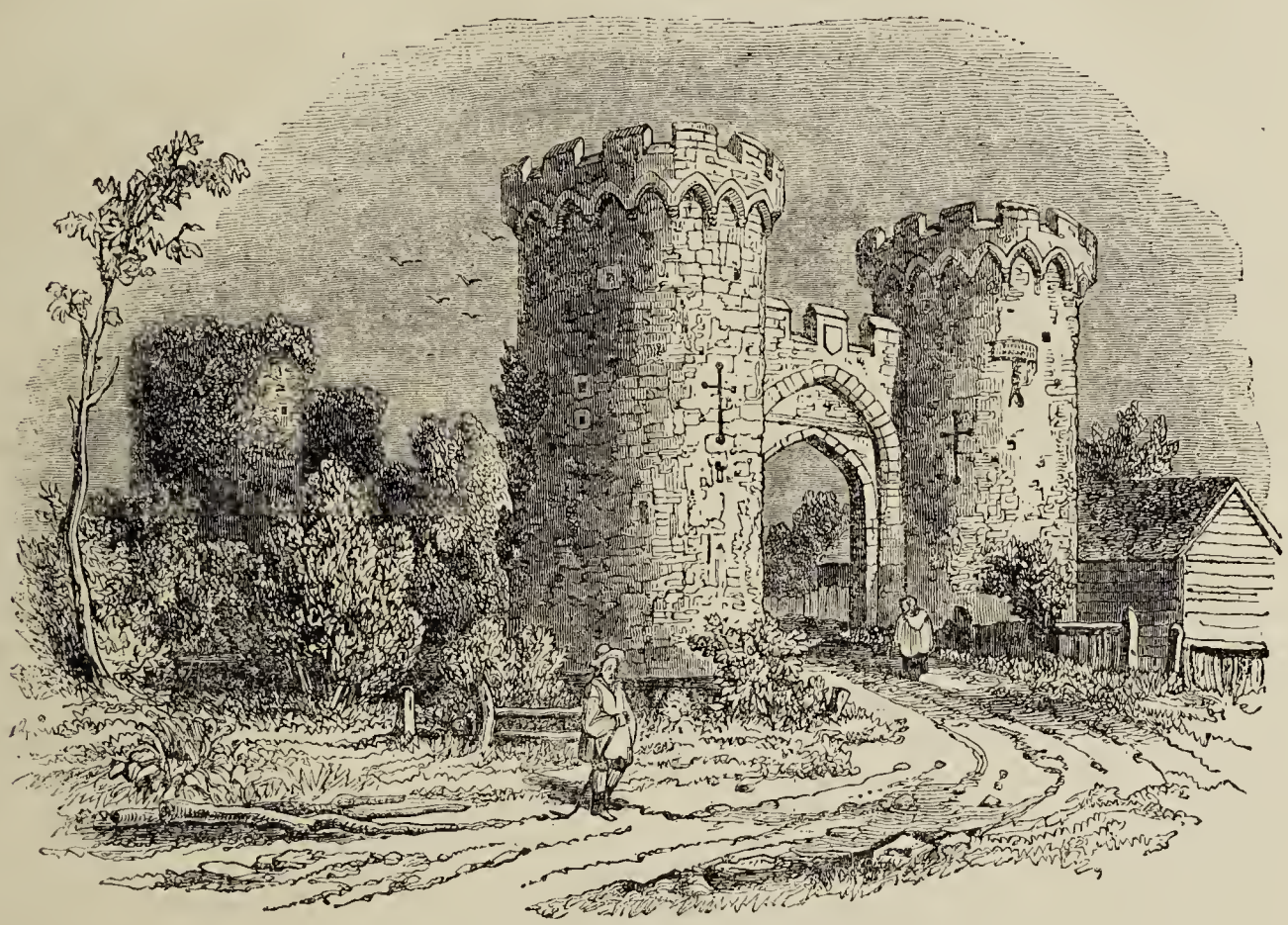
COWLING CASTLE, KENT.



[Present state of Gateway to Cowling Castle.]

COWLING, or Colinges, said to be so called from its cold bleak situation, lies about four miles north-east of Rochester, in Kent, not far from the banks of the Thames. The earliest circumstance known of its history is the grant of the place to Eadwulf, in 808, by Cenulph, king of Mercia. In the reign of the Confessor, Earl Leofwyne, sixth son of Earl Godwin, and brother of the unfortunate Harold, possessed the lordship. He was slain at the battle of Hastings, and Colinges bestowed by the Conqueror on his half-brother Odo, Bishop of Bayeux. On the disgrace of the prelate, some years after, Cowling reverted to the crown. In the reign of Edward I., we find it in the possession of Henry de Cobham, of Cobham, in the same county, and in the reign of Richard II., of Henry's grandson John, who, having obtained leave to embattle and fortify the manor-house, built Cowling Castle in or near a park then existing here. The tablet on the eastern tower of the gateway was placed there at this period, to commemorate the grant. The grand-daughter and heiress of John de Cobham married Sir John Oldcastle, who in her right assumed the title of Lord Cobham. This nobleman, being accused of heresy, as one who favoured the doctrines of Wickliffe, took himself to Cowling Castle for safety, and when the archbishop's messenger appeared, refused to admit him, and the latter was consequently compelled to return without accomplishing his errand. Lord Cobham was, however, as is well known, ultimately hung alive in chains in St. Giles's Fields, — the first martyr among our English nobility. The estate remained in the possession of his wife.

During Sir Thomas Wyatt's brief insurrection, in the first year of the reign of Queen Mary (Sir George Brook, Lord Cobham, being then the possessor of Cowling), Sir Thomas came with six pieces of cannon, and endeavoured to obtain possession of the place. But it was too strong for him; accordingly, after breaking down the gate and a part of the wall, he marched away towards Gravesend. In the first year of the reign of James I. the estates were again forfeited to the crown, by the attainder of George Brook, Esq., for his participation in the schemes of his brother, Henry Lord Cobham. James was, however, generous enough to restore them to the heir, who died in 1668. In the following year, the husbands of his three surviving daughters and co-heiresses agreed to divide the estates, royalties, &c. equally. The castle fell to the share of Sir Thomas Whitmore. Since that period Cowling has passed by sale into other hands.

The castle occupies a low and marshy site, not far from the parish church. It was originally a square building, flanked by towers, surrounded by a moat, and having at a short distance a detached gateway for the principal entrance. At the south-east angle are the remains of a circular tower, picturesquely clothed with ivy, but the rest of the building, with the exception of the gateway, is little better than a heap of ruins. The gateway is a very bold and handsome structure, consisting of an arched doorway, flanked by two large semicircular towers, embattled and machicolated. The groove of the portcullis is still distinct. There was an ascent by a flight of stone steps within each tower to their roofs. On the front of the eastern tower is affixed the tablet before mentioned; this is of brass, in the form of a deed or grant, with Lord Cobham's seal of arms depending,

and bears the following inscription, in ancient characters:—

"Knoweth that beth and shall be
That i am mad in help of the contre,
In Knowing of whiche thyng
This is Chartre and Wytnessing."

According to tradition, the founder was apprehensive that the strength of his castle might give umbrage at court, and therefore set up this inscription to avouch for the purity of his intentions. The inner area of the castle is now cultivated as an orchard or garden, and the whole demesne tenanted as a farm.

DIFFICULTIES OF SURVEYING AND ALLOTTING IN NORTH AMERICA.

[From a Correspondent.]

They only who have had to do with new colonies can possibly be aware of the hardships, privations, and frequently dangers that the first settlers have to encounter. When a small spot has been taken possession of, for the nucleus, as it were, for future colonists to gather round, the adjoining territory, or such parts of it as may seem to offer the greatest advantages for emigrants to settle upon, are explored, agricultural views commonly taking the lead when new settlements are about to be formed. In the first place the land has to be surveyed, subdivided, and marked out into lots, when plans and maps are executed by the surveyor, in order that those who feel disposed to enter into contracts may better understand the nature and situation of their purchases.

Without entering into a minute detail of what generally takes place during the first few years of the establishment of a settlement or colony in some distant foreign clime, I will proceed to explain the manner in which our North American possessions are from time to time extended and enlarged. According as the demand for lands is greater or less, so are the services of the surveyor and his assistants required in a corresponding degree, for it is the surveyor who is the first to make inroads upon the desert and trackless wilderness; and, for the convenience of government arrangements, the wild lands are usually apportioned out into lots, some time before they are actually wanted, or even offered to the public for sale.

In all countries where the ground in its natural state is an interminable forest, the difficulties a surveyor has to encounter cannot differ materially, except as it may regard a difference of climate, and the facilities that the country may afford for a supply of provisions for the surveyor and the parties he finds necessary to take along with him into the woods. In nearly all our new colonies, the first local divisions that are formed are townships, for the old-fashioned term parish is rarely or never heard of; and it commonly happens that a district with undefined limits, except, perhaps, in some particular direction, has first received a name, hence the new township is said to be situated in such a district. In the example which I am about to introduce, the township which had to be surveyed was in the north-western part of the Home District, Upper Canada, and the survey was executed about fifteen years ago. Townships in most of our colonies, where there is nothing to prevent it, are commonly laid out in squares of six miles each way, that is, in blocks containing thirty-six square miles, or 23,040 acres. Sometimes, however, they are run out ten miles square; but this size is inconveniently large when the lands become settled, and township-officers have to perform certain duties, which, over so great an extent, they find very inconvenient. In countries like Upper Canada, where the lands have been progressively settling for so many years, it is usual for the new township to be laid out (located, as they phrase it) considerably in advance of the sales that actually take place; so that it sometimes happens that there are two or three new townships, one in the rear of another, in none of which are there any regular or permanent settlers.

Previous to my being appointed to make the survey of the new township under consideration, I had never passed so long a period in the "bush" (as the forest is called) as this survey was likely to subject me to, although it was nothing new to me to have the branch of a pine-tree for my bed, and a couple more over me in the place of a blanket and counterpane. However, I had no misgivings on that account. Wild and desolate as the forests are, you seldom traverse any great extent without falling in with some dim track, called an Indian path, which, in many cases, however, is nothing more than the track of deer or other wild animals. Along many of these tracks, with making occasional deviations to get round large prostrate trees, &c., a horse that has been accustomed to travel in the woods may be got along, even with a moderate back-load, swamps and rivers being the main obstacles one expects to meet with. A wind-fall, however, is commonly worse than either; for where a violent tempest has prostrated the whole forest for a considerable space, which often happens in America during some summer storms, it will be found utterly impossible for a horse to attempt the passage; indeed it is often with extreme difficulty that the practised woodman can scramble his way through such obstructions. On the occasion alluded to I was informed that there was an Indian path leading to the adjoining township to the one I was about to survey; and from the maps of the surveys that I had to pass through, copies of which I took with me, I discovered no signs of any streams or rivers of much importance.

Having engaged two active chain-men and an axe-man, who, occasionally, was to act as hunter to our party, and having laid in a stock of provisions, which, with what we probably might procure by a little hunting and fishing, should the ground afford either game or fish, we calculated might serve us for three or four weeks, and which we contrived to pack on the back of a sure-footed horse, along with a small tent-cloth and some blankets I had taken care to provide myself with, and an extra lad to bring back the horse as soon as we reached our destination, we set out from Ancaster, a village near the extreme western end of Lake Ontario; and crossing Dundas Street, nearly forty miles west of Toronto, then called York, the first evening we reached the last settlements towards the uninhabited wilderness, and there we remained for the night. Next morning, at an early hour, we took the path that led into the neighbouring woods, which appeared to lie in the direction of the place we were bound for, although I had never yet seen it: but one of my chain-men had been employed by the surveyor that located the adjoining township, and on that occasion had travelled by the same track; I therefore made him take the lead, for I considered him our pilot. During our excursion through nearly twenty miles of the gloomy and still forest—for it was during the month of May, and scarcely any of the few summer birds that annually visit those regions had as yet arrived—and although I was all the way on the look-out for game, I never had an opportunity of discharging my gun; and my axe-man, who carried a rifle, never fired it but once, and that was at a ruffed grouse as it skimmed through a grove of young hemlock-trees; and he being unaccustomed to shooting at game on the wing, the bird flew on unscathed by his rifle-bullet.

That night we reached the confines of our new and unexplored territory, for we had little difficulty, from my chain-man's recollection of the marks the other surveyor had made on certain trees, with the assistance of the map of the survey, in establishing our whereabouts with much certainty. After having made the necessary arrangements for passing the night, that is, lighted a good fire, secured our stock of provisions, and selected sleeping-berths upon a few flexible branches of a neighbouring spruce-tree for

a bed, and my knapsack and oil-skin jacket for a pillow, with a folded blanket thrown looscly over me, I essayed to pass the first of a whole summer of nights as comfortably as I eould; although the idea of spending several months in this manner was, I must confess, by no means calculated to induce pleasing dreams.

On the following day, having sent baek the horse and its conductor, I proceeded to explore the whole abutting-line of the adjoining township, in order to make myself as familiar with it as possible, the old chain-man, who recollected it remarkably well, accompanying me along the line; while the other men were engaged in examining into the interior of the tract of land we were about to commence work upon, principally with a view of finding a suitable spot for our future encampment. There were two or three considerations in this matter, it being absolutely necessary that it should be conveniently situated as regarded our daily work; and that, if possible, it should be adjoining some stream or piece of water that would afford us fish, and at the same time upon dry ground, and at somc distance from any putrid swamp. When we all met in the evening, the men reported that thcy had discovered a pond (so the smaller lakes are generally called) of ncarly a mile in lcngth, but narrow, and running obliquely through the survey, but no stream of any account falling into it; and that from the fish-hawks they had seen in the vicinity of this piece of water, they doubted not but it abounded with fish. They seemed to consider this intelligence a piece of good news, while I considered it directly the reverse, for I knew it would cause me an infinite deal more trouble with the survey, and at thc same time reduce the quantity of acres. As far as a scientific knowledge of surveying is required, nothing can be more simple than the way in which these township surveys are executed where there are no obstacles such as ponds or rivers running through them. The theodolite, the most effective instrument for extensive surveys, is rarcly used, a large compass with correet sights being the only instrument, excepting the chain, used in those surveys; for although it is impossible to run a long line with perfect accuracy by the best common compass, yet, where extreme nieety is not required, and where the lines are but a few miles long, a practised surveyor will deviate but little from the true eourse in any line he may take. I would here remark, however, that in some of our older colonies, and particularly Lower Canada,* the recent surveys which have taken place have proved the extreme inaccuracy of some of the old ones, since neither courses nor distances in many of them were found correct.

Having spent a second day in making some further exploration and getting our camp a little into order, on the third day I prepared to run our first line, that is, I re-measured the rear line of the township that had been previously surveyed, which was the front line of our survey; and employing a two-rod chain (four-rod ones do not answer for the rough woods), I found that in chaining nine hundred and sixty chains (six miles) we varied from the old measurement only four yards, or eight-elevenths of a rod. This was very satisfactory; for as it was desirable that the corners or angles of the lots I was about to survey should correspond with the corners of the lots in the old survey on the opposite side of the division line, I now found there would be no difficulty on this head. I next chained onc side of my own block, staking, as I went along, the points from which the cross-lines were to be taken, then the cross, or end-line, if I may so call one side of a square; and having returned to the old township line, I then ran the other side-line, meeting the end of the last line whcre I left it, uniting the two lines without either of them varying from the correet length above one-third part of a rod, which I considered good work with a plain seven-inch compass. But the method of chaining in the woods remains to be explained: thc surveyor (in thc instanee alluded to it was myself) carries the compass slung under his left arm, and coverecl with a brass cover or case, exccpt when in use, the sights projecting inwards, one in front, and thc other in rear of his person, in order to prevcnt aceidents happening to them where there is a difficulty in creeping through the thick underwood. Thc compass-stand has not three legs, as is usual with mathematical instruments of this sort in open countries, but consists of a single stout staff, well shod with iron pointed with steel, which is stuck firmly in the ground when thc surveyor has a sight to take, the head of which is supplied with the ordinary ball and socket on which such instruments traverse. Having planted his compass at the commenee-ement of the line he intends to run, and having arranged the sights to the proposed course or particular degree, when the underwood is not thick, it frequcntly happens that a tolerably clear way may be seen among the trees to the distance of ten or twenty chains, until some stout tree appears to stand upon the exact line that has to be run, and interrupts the view. This tree the surveyor particularly notiees, for he calls it a sight-tree; and having slung his compass under his arm, pulled up his compass-staff, and called out "chain" (as a signal for the chain-men to commence measuring), he sets off ahead of the chain-men, taking the axe-man along with him, who here and there cuts down small saplings that seem in the way or the chain-men, which serves also to mark the line; and having reached the sight-tree, on which he has kept his eye the whole way, he goes to the front side of it, and there re-sets his compass, during which the axe-man is engaged in marking the tree in a particular manner (three, four, or five notches both in front and rear); while the surrounding trees, particularly the young ones, are scored with a similar number of notches on the side of each, looking inwards, or towards the sight-tree. The trees thus marked are called witnesses, and the object in marking them in this manner is, that in case of the sight-tree being cut or blown down hereafter, its place may be nearly ascertained by the position of the witnesses. When the chain-men have measured up to the tree in question, the distance, as well as thc sort of tree, is noted in the surveyor's field-book. By this time a new objeet has been taken, and forward goes the surveyor and the axe-man again. He never, however, heads the chain-men so far as to be out of hearing of anything either party may have to communicate; for in order to prevent mistakes of ten chains, he carries a tally-strap round his waist, with sliding rings or pieces of horn upon it; so that when the leading chain-man has got to the end of ten chains, and consequently used his whole number (ten) of pins or arrows, he calls out to the hind chain-man "tally," the reply to which from the hind chain-man is "tally one," or "tally fifteen," or any other number, as the case may be; upon hearing which, the surveyor counts the tallies he has passed from one side of his belt to the other, to ascertain if the chain-man is correct in his number of tallies, he, as well as the surveyor, carrying a strap round his waist with the number of tallies upon it. If there be no error in calling the number, no remark is made; bnt if the tallies do not correspond, the matter has to be examined into. It sometimes happens that the underwood is so thick, that it is impossible to sec four rods ahead, in which case the chain-men have to assist the axe-man in opening a track sufficiently widc for the surveyor to get a sight through: this, however, makes the work progress very slowly. In the survcy alluded to, we found three or four cedar-swamps, marshy pieces of ground wherc those trees grow in such close contact, that it is next to impossible to squeeze through among them. Besides, the trees being so close to each other, the ground is generally so boggy that a person will sink knee-deep; and what renders these places still more dreary and dismal,

* See 'Parliamentary Reports of the Commissioners under Lord Durham's late Commission.'

the branches of the trees are so intermingled with each other, that the brightest sun that ever shone cannot penetrate the dark foliage one-third of the distance from the top to the ground; so that when fairly within a tolerable-sized cedar-swamp, though at noon on a cloudless summer day, you find yourself in a pitchy darkness. It is impossible, therefore, to run a line with any degree of accuracy through such places until the axe-man, perhaps up to his knees in mud, has exercised his calling, which renders the surveying of a cedar-swamp a slow and disagreeable business: and, when the work is performed, such tracts are absolutely worthless, as no settler, while there is another acre of land to be had, would think of attempting the cultivation of a cedar-swamp.

The usual custom in those township surveys is to run out the land into section, half-section, and quarter-section lots, that is, first into blocks of a square mile each, or six hundred and forty acres, a traverse line dividing them into half-sections; and if crossed again by another line, the mile is divided into four equal lots of one hundred and sixty acres each. Thus if the surveyor meets with nothing to obstruct his progress, and his instructions are to lay out the survey in quarter-sections, in a township six miles square, he will have to run thirteen lines across it each way, subdividing the thirty-six square blocks into four times the number, or one hundred and forty-four lots of one hundred and sixty acres, and the chaining of which would amount to one hundred and fifty-six miles. This distance in an open country would soon be got over by an expert surveyor; but none but those who have encountered them can form a correct opinion of the nature and extent of the difficulties of surveying in a dark, desolate, and impervious forest. On the occasion alluded to, I met with more than an ordinary share, for in addition to the cedar-swamps already noticed, the small lake which the men in their first exploration discovered gave me a vast deal of extra trouble, and greatly interfered with the shape and regularity of a considerable number of lots. However, we reaped some benefit from it, for we found it well-stocked with fish, amongst which were grey trout, pickerel, striped bass, and mullet in vast abundance; so that one or other of the party would practise fishing for an hour or two in an evening or morning, and seldom fail in supplying the whole party with an abundant meal. The provisions we brought along with us, as well as those we afterwards had sent to us from time to time, consisted of salt pork, dried venison, a little lard to fry our fish with, some Indian meal for cakes (which we managed to bake in the ashes, Indian fashion), with some coffee and maple sugar, and some indifferent whiskey to mingle with the water, which was not of the best quality. Of game we found but little; for during the summer we captured but four deer, besides which we occasionally got a partridge (so called in that country), a duck or two of a poor sort, and sometimes a few wild pigeons. Our hunter once succeeded in capturing a bear, but it was so old and tough that we none of us relished it. There were both racoons and wood-chucks in our vicinity, but we were never induced to make a meal upon either of them, although the latter is considered by many as making an excellent stew; but I must confess I have partaken of stews that I liked better. On the whole, however, we fared tolerably, that is for a party encamped in the woods; but our quarters were not the most comfortable in the world; by the middle of June the woods began to swarm with musquitoes, and they continued with us the whole season. During the night we had to keep up smoky fires close to our berths, which, though very disagreeable in hot sultry weather, we preferred to being the prey of thousands of those nocturnal tormentors.

At the period I allude to it was the custom for the surveyor to receive his pay in wild lands, a portion of those he surveyed. It was left to him to make his selection; so that it was presumed that those lots which, when the lands were afterwards offered for sale, had the surveyor's mark upon them, were the best lots in the whole township, the soil being considered of a superior quality, or else possessing some local advantage, such as favourable situation for mill sites, or where some future line of road would pass, or probably the site of some town or village. Where large streams or rivers intersect a survey of this sort, so that it may be made available for the transportation of lumber, farm produce, &c., the lands are commonly run out into lots, with narrow fronts abutting upon the river, the rear of them stretching far back into the forest; and although such shapes for farms are highly objectionable, the prospective advantages of water-communication are considered more than an equivalent, and such lands are commonly the most eagerly sought after.

Tristram Shandy.—At present, nothing is talked of, nothing admired, but what I cannot help calling a very insipid and tedious performance: it is a kind of novel, called 'The Life and Opinions of Tristram Shandy,' the great humour of which consists in the whole narration always going backwards. I can conceive a man saying that it would be droll to write a book in that manner, but have no notion of his persevering in executing it. It makes one smile two or three times at the beginning, but in recompense makes one yawn for two hours. The characters are tolerably kept up, but the humour is for ever attempted and missed. Dodsley has given him six hundred and fifty pounds for the second edition and two more volumes (which I suppose will reach back to his great-great-grandfather); Lord Falconberg, a donative of one hundred and sixty pounds a year; and Bishop Warburton gave him a purse of gold, and this compliment (which happened to be a contradiction), "that it was quite an original composition, and in the true Cervantic vein:" the only copy that ever was an original, except in painting, where they all pretend to be so. Warburton, however, not content with this, recommended the book to the bench of bishops, and told them Mr. Sterne, the author, was the English Rabelais. They had never heard of such a writer. Adieu!—*Letters of Horace Walpole.*

Anecdote of a Pilot-Fish.—On our voyage home from Australia, during the seven or eight days we were becalmed on the equator, we caught two sharks. On the approach of the first, the water being quite clear, the pilot-fish was observed swimming either just above the shark's head, or by the side of his dorsal fin. He was no sooner hauled in, than a passenger, having baited a small hook with a piece of pork-fat, caught the pilot-fish also. He was a beautiful little plump fish, about seven inches in length, and marked transversely with four or five bright blue bands. Two of the sucking-fish (remora) were found adhering to the shark; and so firmly did they maintain their hold, that it was not until after repeated lashings of his tail on the deck that they were dislodged from their position. Having picked them up and placed them in a bucket of water, they immediately fastened on its sides in the same manner. Their length was four and five inches. A day or two afterwards, when the second shark was caught, I procured another remora, and all three of them were put into a cistern of water, where they seemed very much at their ease for several days, but were at last lost by drawing off the water to wash the decks. But the pilot-fish on this occasion was proof against the allurement of pork-fat: he patiently swam backwards and forwards, waiting for the return of his master. Next day he swam round and round the ship, at times leisurely, but often by sudden starts, betraying impatience and anxiety. This he continued to do for two or three days, until a gentle breeze at last gave the ship some motion on her course. Still he followed her: day after day, a dozen times a day at least, whenever any one looked over the stern, there he was, and he alone, close to the rudder, availing himself of the advantage of being in the eddy-water. Occasionally he dropped a little way astern, and then he would make a vigorous effort and regain his former position. This continued for more than a fortnight, during which we had run at least 2000 miles, when, arriving in a higher latitude, stronger breezes so ruffled the surface of the water, that the little pilot-fish was seen no more.—*From a Correspondent.*

DRUIDICAL REMAINS.—No. I.

[General View of Abury—restored.]

There is perhaps no subject on which antiquarians have more employed their learning and industry, on which their theories have been so fruitful, or their discussions so endless, as on the origin and history of those ancient stones generally denominated Druidical; we wish we could add that the results had been proportionate. But it is not so. Some brilliant practical discoveries have been made as to the ancient state of these remains; Abury, or Avebury, for instance. But in most other respects, as to who were the founders, as to when they were founded, or as to the immediate object of their foundation, we may almost be said to be as essentially ignorant as ever. At the same time the undoubted antiquity of these remains, the tolerably accurate glimpses of their original condition which the antiquarian writers afford us, and the very mystery in which they are enveloped, altogether make their study peculiarly attractive. But more than all this, there is one fact connected with these antique monuments, which renders them of very high interest indeed, and that is, their dispersion over every part of the world, bearing evidently a common impress of the ideas and habits of their founders even in places so remote from each other as to make it appear almost impossible that there should have been any mutual intercourse in those ancient times. As to the maritime commerce of the Phœnicians, a solution of the difficulty offered by some antiquarians, that is now looked upon as quite inadequate to explain the presence of these remains in the many distant parts of the world. Monuments of large and rude stones, disposed in the forms known respectively in our country by the names of circles, cromlechs, kist vaens, and stones erect, are found extensively dispersed through Great Britain, Ireland, Jersey, Guernsey, Denmark, Sweden, France, and Germany; and though apparently less numerous, their existence is unquestionable in the Netherlands, Portugal, Malta, Gozo, Phœnicia, Malabar, Bombay and other parts of India, Palestine, Persia, Northern Africa, North America, and in the islands of the Indian Archipelago and of the South Sea. What conclusions then can we draw from these phenomena, but that those common ideas and habits of which we have spoken must have existed prior to the dispersion of the great family of man, of which the Scriptures tell us? If the identity of the monuments known as Druidical in this country with those existing in Palestine and other parts mentioned in the sacred writings be acknowledged, this important result follows:—that whilst, on the one hand, "the form of existing monuments illustrates the form of those mentioned in Scripture;" on the other, "the uses of those described in Scripture illustrate the uses of those now existing." This view is so ably developed in the work which we have just quoted, 'The Pictorial Palestine,' that we shall avail ourselves largely of its pages in the course of our subsequent articles.

Of stone circles, the grandest that perhaps any country has possessed is, or rather was, that of Avebury in North Wiltshire. This has not been noticed previously in our pages, and may therefore be described at some length. The site is a flat area of ground, having hills or rising grounds on three sides, and a level country on the fourth, or north side. Over the surface of the ground, both of the neighbouring valleys and of the high lands, lie dispersedly about large masses of stone; a great number of those near the Bath road are still known as the Grey Wethers, from the appearance they present on the downs, when looked at from a distance. From among these stones the founders of Avebury selected no less than 650 to form their building; their size above ground varying in height from 5 to 20 feet, and in width and thickness from 3 to 12 feet. One hundred were set erect as the boundaries of a nearly circular area of about 1400 feet in diameter. A very deep trench was dug without the stones, and the earth thrown up beyond (a circumstance that proves that no military defences were being constructed) to form a bank. The inner slope of this bank measured 80 feet, and the circumference at the top was 4442 feet; the area thus enclosed was above 28 acres in extent. About half way up the inner slope was a kind of terrace-walk intended apparently for spectators. Dr. Stukeley thought that within this great stone circle there might have been another, from the circumstance of his finding a large stone in a position where it could not have formed a portion of the outer circle, nor of either of the two smaller inner circles. Of these last, one was a double circle formed of 42 upright stones enclosing a single upright stone in the centre; and the other, also double, enclosing a group of three tall stones, called the Cove, and comprising in all 45 stones. This was the general design and arrangements of what we may call the body of this triple temple, but there remain to be described the limbs, or avenues, which form a striking peculiarity of Avebury as distinguished from other works of the kind. The bank is now broken down in four

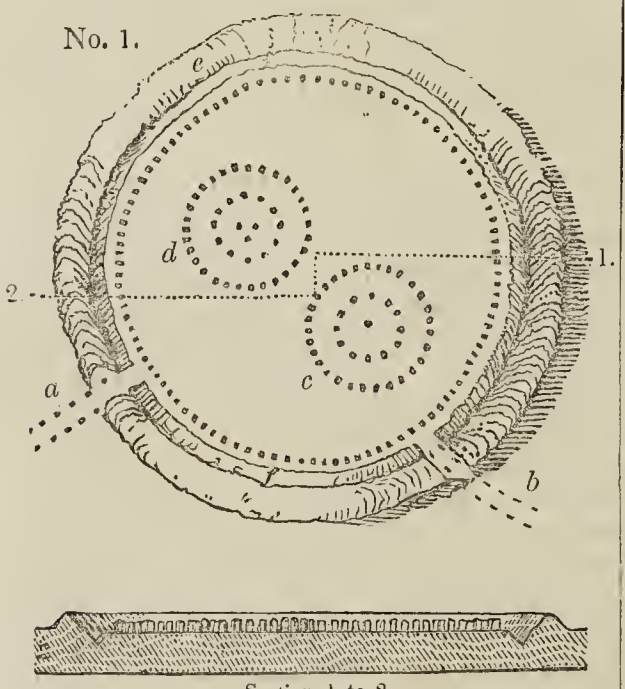
places, but it is conceived that only two of these places mark the original entrances, which are on the west and on the north. From each of these entrances branched off an avenue of approach, extending for above a mile, and formed of two rows of upright stones. The southern or Kennet avenue turned near its extremity towards the south-east, and terminated on the lower part of a hill called the Hakpen, in two oval ranges of upright stones one within the other; the outer measuring 146 feet in diameter, the inner 45. This avenue in all comprised 258 stones, placed on an average about 86 feet apart in the linear direction; the breadth of the avenue varies, for a reason that will presently be seen, from 56 to 35 feet. The western or Beckhampton avenue was a mile and a half long, its extremity, according to Dr. Stukeley, ending in a single stone, and the entire number of stones being 203. The avenues were not arranged in straight but in flowing curved lines, in order, says the same authority, to imitate the natural action of the serpent.

"The Druids, in laying down this design, that it might produce a magnificent effect, suitable to so great and operose a work, studied the thing well. As this was to be a large picture, a representation of an animal, they prepared to follow nature's drawing as far as possible. A snake's body has some variation in its thickness, as slenderer towards the neck than in its middle; this the Druids imitated in making the avenue broader towards the southern entrance of Abury, and drawing it narrower as it approached Overton Hill [or the Hakpen]. Again, when a snake is represented in its sinuous motion, the intervals of the stones sideways must have a variation as set in the inner or outward curve, so as to make them stand regularly opposite to one another, and this, too, is properly regarded in the work."* And thus, from a few stones scattered about, without any apparent order or system, among fields, gardens, and cottages (for a village or hamlet has unfortunately grown up on the site), has the genius of Dr. Stukeley restored to the world the grand edifice we have described. Of the general truth of his description no doubt is now entertained. Sir Richard Colt Hoare, one of the most careful and accurate of observers, whilst correcting, in his 'History of Wiltshire,' some of the minor inaccuracies of that description, acquiesces in its general fidelity. We need only add that, apart from the multifarious evidence as to the respect or worship paid to the serpent as a symbol of the Deity, by the nations of antiquity, that Stukeley presents, in his 'Abury,' drawings of Egyptian monuments presenting the almost precise outline of the former, including both the snake and the circle; and that the hill on which the oval forming the head of the snake rests is still known as the Hakpen, or *Snake's Head.* It may be interesting to give the dimensions of Avebury as contrasted with the dimensions of the so much better known Stonehenge:—

Number of stones at Avebury	.	652
„ „ Stonehenge		140
Extent of Avebury	. . .	8750 cubits.
„ Stonehenge	. .	240 „

* Stukeley's 'Abury.'

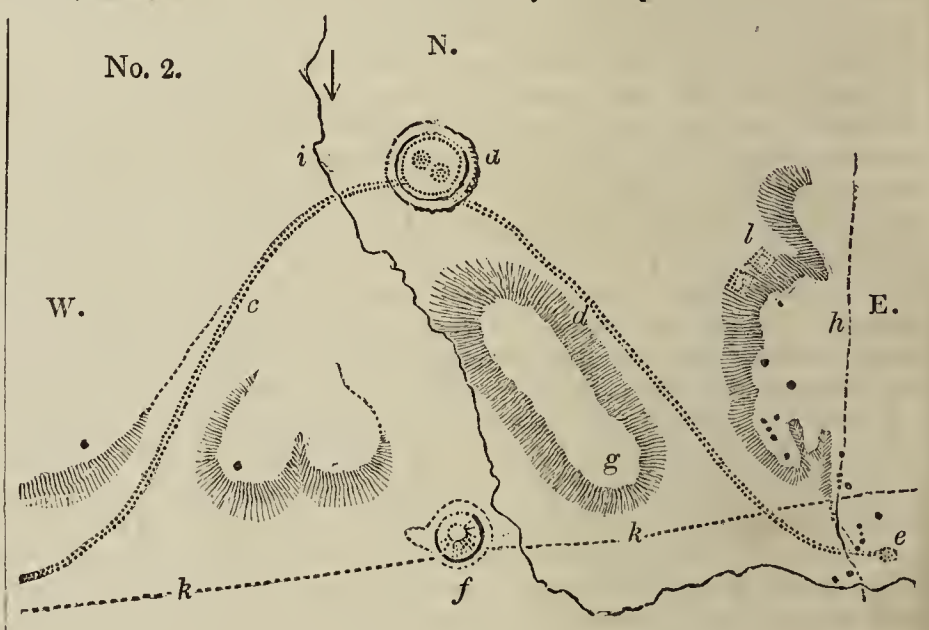
No. 1.



Section 1 to 2.

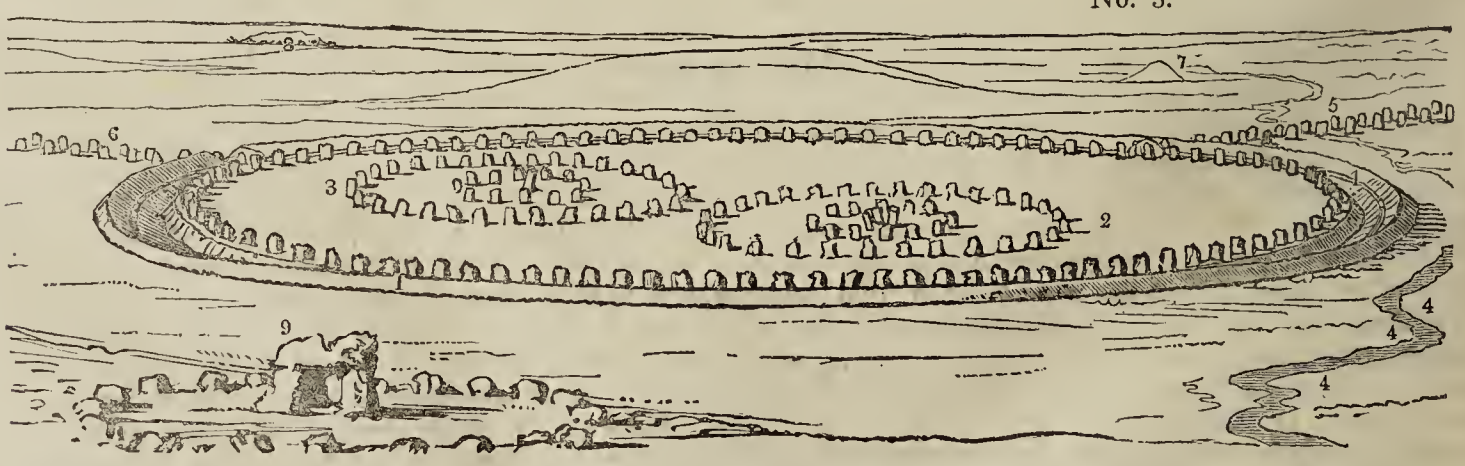
[No. 1.—*Ground Plan of the Temple*, with a sectional view of the same from 1 to 2, *i. e.* from east to west. The plan, though on a small scale, shows the relative proportions and arrangements of the lofty bank, or vallum, *e*; the ditch, or moat, *f*; the commencement of the western or Beckhampton Avenue, *a*; the southern or Kennet Avenue, *b*; the southern inner temple, *c*; the northern inner temple, *d*.]

No. 2.



[No. 2.—*Plan or Map of the whole Temple*, with its two avenues, *c* and *d*; the temple, *a*; a small temple *e*; Silbury Hill, *f*; high ground, *g*; a line of road, or British track-way, *h*; the course of the river Kennet, *i*; line of Roman road from Bath to London, *k*; * * barrows; site of village, *l*.]

No. 3.



[No. 3.—*A bird's eye View of the Temple*, from the north, looking south, and intended to display the circumvallated bank, 1; the two inner, or small temples, 2 and 3; the course of the Kennet river, 4; the western avenue, 5; the southern avenue, 6; the situation of Silbury Hill, 7; a large barrow, called by Stukeley the Druids' barrow, 8; a cromlech, surrounded by a circle of small stones, 9.]

Seeing this, we can assent to the remark of Aubrey, the earliest observer of Avebury (who did not, however, publish his observations), that "this old monument does as much exceed in greatness the so-renowned Stonehenge as cathedral doeth a parish church."*

But we have not yet done with the wonders of Avebury. In a situation that seems to leave no doubt that it was one of the component parts of the grand temple, is an artificial conical mound of earth called Silbury Hill, forming the largest tumulus in Europe, and one worthy of comparison with those mentioned by Homer, Herodotus, and other ancient writers. The following calculation is by Mr. Edward Crocker, a scientific and practical surveyor:—"The circumference of the hill, as near the base as possible, measures two thousand and twenty-seven feet; the diameter at top, one hundred and twenty feet; the sloping height, three hundred and sixteen feet; and the perpendicular height, one hundred and seventy feet; but that part of our measurement which will excite the most surprise, is that this artificial hill covers the space of five acres and thirty-four perches of land." A proof that this wonderful work was raised before the Roman-British period, is furnished by the Roman road from Bath to London, which is straight for some distance till it reaches the hill, where it diverges to the south to avoid it, and then again continues its direct course. Many burrows are found in the neighbourhood, one of which the Roman road just mentioned has cut through. Other Druidical remains also are found around Avebury, including circles, cromlechs, and stones erect, confirming the impression that this place must have been the greatest and most important of the kind in Britain. No marks of tools are anywhere visible on the stones of Avebury; they were set up in all their rude natural grandeur; whilst at Stonehenge some of the stones have had mortice-and tenon joints, and the whole have such a comparatively architectural appearance, that Inigo Jones attributed the work to the Romans. From this comparison alone the great antiquity of Avebury is evident. One writer, indeed, has remarked that its date may be referred to a period as far beyond the date of Stonehenge as the date of Stonehenge is beyond the present times.

Is it not melancholy to see so grand a monument of the primeval ages, after withstanding successfully the ravages of time, wind, and weather, at last doomed to destruction by the hand of man.! Yet that is the history of Avebury. When Aubrey examined the place in 1648, there were sixty-three stones within the enclosure; these were reduced to twenty-nine when Stukeley made his plan in 1720, and to seventeen when Sir Richard Hoare examined the spot in 1812. Some of the stones have been used to build the houses of the village, others have been broken up and removed for the miserable consideration of the little ground on which they stood, whilst certain individuals—the Tom Robinsons and others, gibbeted by Stukeley in his indignant pages—seem to have no motive but the reputation they obtained for their skill in this sort of destruction.

SKETCHES OF THE COASTS FROM SINCAPORE TO PEKIN.

IV.—The Coast of Quang-tong.

[Continued from No. 533.]

It may not be amiss, before we say something of the ship-passage to the Bocca Tigris, to notice the Hong-sham or Broadway River, which flows from Canton west of the great delta on which Macao stands, and is navigable by the capacious passage-boats of the Chinese.

Departing from the inner harbour of Macao, and leaving Casa Blanca (Treer-shan, a little town, and the residence of a minor mandarin) on the right, the boats, urged forward sometimes by the paddle, at others by the pole, make their way over the Macao flats to the mouth of the river, which is nearly stopped up by a great island nearly five miles in length, lying across, and leaving only a narrow passage on either side. The eastern channel is remarkable for the Amacoch pagoda, and farther on the Mo-low fort. Having got fairly into the river, which soon becomes fresh, you behold a stream near half a mile wide, stagnating here and there in large pools. The country is pleasant enough, having on one side broad rice-fields and meadows, and on the other the high land behind Macao. On one of the most lofty of these mountains, from which a splendid view of the surrounding bays and islands, and even of the open sea in the distance is obtained, Camoens is said to have composed the greater part of his 'Lusiad.'

Hong-sham is about a third of the distance between Macao and Canton. It is a large village scattered over a great space of ground. The houses are for the most part of timber, and thatched. There are four or five market-places, where are sold clothing, silk, calicoes, drugs, spices, provisions, &c. Behind is a great structure called a fort, with a few towers. A mandarin, with a squadron of junks, is stationed here to guard the passage.

There are several other towns between Macao and Canton, one of which is like an inhabited wood, each house having several trees around it. The pagodas now begin to be numerous, crowning the summits of the hills, or shooting up from the green rice-fields, the woods, and the meadows. The general character of the scenery is that of a fertile plain, with insulated clusters of granite hills rising at intervals. The river is generally crowded with boats employed in fishing for prawns and those oysters whose inner shells serve as windows for houses. The water branches off in all directions into canals and streams and creeks; islands intervene here and there, and presently over the rice-grounds that lie above Whampoa the city of Canton appears, with the long row of European factories.

Returning to Macao, and setting sail with the ships bound for the Hoo Moon, we leave on the right the great island Lantao, with its peak, and soon come in sight of Lintin (near thirty miles above Macao), where the European ships of war are compelled to cast anchor, and where the opium smugglers have established their depôt and rendezvous. A long bar of sand runs north and south, but on the west is the bay and anchorage. Here there is a village, and at the foot of the peak which runs in the centre of the island, the watering-place, where the stream flows through a bamboo into the casks, but is of inferior quality. A few bears are found among the hills, but how they got there is not known; they are, however, supposed to have broken loose from some ships in the river. Formerly the citizens of Macao used to frequent this and the other islands to enjoy the pleasures of the chace.

The remainder of the passage has been rendered tolerably familiar to the English reader by the account of the brilliant exploit of the Imogen and Andromache, which forced their way past the Ananghoy and other forts in 1834. The feature of the scene most worthy of remark is, that in proportion as we leave Macao behind us the mountains slope into hills, and finally sink away into long level plains, intersected by canals, and covered with numerous villages and detached houses, together with plantations of oranges, plantains, and bananas. Low rocks, banks, bars, shoals, shallows, eddies, irregular tides, under-currents, and waterfalls occur more frequently to exercise the ingenuity of the pilot; and within the Hoo Moon vast salt marshes covered with reeds, flags, and rushes, deep creeks, inlets, bays, and the many mouths of the Tong-Kiang river, flowing from the east, insulate the various woody hills and plantations, with the ever-recurring pagodas that diversify the landscape.

But a picturesque and important feature of the scene is

* MS. in Hoare's 'Ancient Wiltshire, North.'

the vast number of craft of every kind which crowd the face of the water, all gliding to and fro, appearing and disappearing amidst the numberless canals, and affording a very favourable specimen of Chinese industry Although these vessels are mere logs when compared with European shipping, yet their appearance, with their large fan-like sails, is very picturesque, and they have the advantage, from their peculiar build and style of rigging, of being able to lie very close to the wind. Some of these vessels are occupied in bearing about the vast flocks of ducks here fed; some examine the fishing-stakes; whilst others are engaged in foreign commerce, steering to and from the straits of Malacca, Patan, Siam, Camboja, Tonquin, Cochin-China, Java, Sumatra, Borneo, Macassar, the Philippine Islands, Japan, and Jesso. Others again are employed in coasting commerce with their own ports, such as those that bring grapes from Ningpo to Canton.

The eastern channels, through which admission is obtained into the bay, are too numerous to be even named in this place. The most seaward island is the Great Lema, which forms the southern defence of the channel of the same name, leading to Lantao passage, used principally during the prevalence of the northern monsoons. The "Ass's ears" are noted landmarks; and in the Ly-ee-moor passage, which runs between Hong-Kong island and the main, there is good anchorage; and on a rock a Buddhist temple, where a bonzee stands continually to beg of the passing junks. All these passages are more intricate than those on the west, as the ships are compelled to push their way through a very extensive archipelago.

In the Hong-Kong island is a stream and a waterfall, in whose neighbourhood the rocks, says Dr. Abel, are composed of basaltic trap, exhibiting in some places a distinct stratification, in others a confused columnar arrangement. In general our geological knowledge of these islands is very imperfect, but it is certain that from the neighbourhood of Canton the rocks are composed of red-sandstone resting on granite, but the islands that form the only ramparts of the coast consist of coarse granite only, with perpendicular veins of quartz. Vast rounded masses of the same rock are scattered over the islands, and even on the summits of the most lofty. These are commonly imbedded in coarse earth (a disintegration of the general substance of the island), which, washed away by the winter rains, leaves them without support, and they roll down on all sides, so that the sandy shores and the shallows round the islands are studded with a belt of rocks confusedly arranged and heaped together.

The Tong-Kiang river, mentioned above, rises in the mountains that divide Quang-tong from Kiang-Si, and after making for Jy-to-so, or Bear Bay, turns abruptly back, and flows by several mouths into the Canton river, within the Bocca Tigris. It bathes in its course the walls of the beautiful city called Haci-tcheou, and, just above the confluence of a small river flowing from the south, is crossed by a beautiful bridge of forty arches. The latter river also runs close under the fortifications on the east, whilst a small lake, diked round with stone, and encompassed by gardens full of lofty trees, almost renders the town an island. In the centre of the lake are two isles filled with country-houses, and communicating by a beautiful bridge. This city is the chief of the district extending from the Tong-Kiang to the sea, and the maritime towns within its jurisdiction are celebrated for the vast number of fish and oysters there found. In a mountain called Lo-fow-shan, in this district, are found gigantic and common butterflies, which are caught and sent to court to be used as ornaments.

The whole province of Quang-tong is generally fertile, although there are some parts, such as the range of rocks on the east of the Pe-kiang river, entirely incapable of cultivation. These have a considerable extent, reaching to within two days' journey of Canton. The most northern are covered with forests; to these succeed vast limestone cliffs with woods interspersed; next follow red-sandstone rocks, and then the country sinks into an alluvial bottom, probably (as well as the great delta below Canton) formed, or at least extended, by the deposits of the rivers Pe-kiang and Si-kiang. The banks of the latter river are covered with fields of rice, not surpassed for luxuriance in the world. These attract, especially about the time of the last harvest, crowds of grosbeaks, and of a delicate species of ortolan, called, from its food, the rice-bird. In the neighbouring woods the common ringdove breeds in great numbers; coveys of partridges abound in the thickets; and here too the chanting thrush, almost the only bird in China that can boast of a song, builds her nest. Immense flocks of geese cover the Canton river during the winter months, and the rocks and cliffs that border the coasts are the habitations and breeding-places of vast numbers of gulls, auks, and cormorants.

Flowers too are abundant, and the mountains are painted with the rose-coloured blossom of the wild downy myrtle (*myrtus tomentosa*); and on the ridge that skirts the western extremity of Fo-kien whole eminences are found entirely covered with flowers. In Kiang-Si likewise there are hills carpeted with the single white camellia, from whose seeds a favourite oil of the Chinese is expressed. When seen from a distance, these look like glaciers in a setting of emerald green, and glowing beneath a bright sun.

The extreme eastern district of Quang-tong is Tchaou-tcheou-foo, celebrated for its large emporium Ting-hai or Ching-hai, inferior only in importance to the capital of the province. The harbour is continually crowded with junks, which trade not merely with Canton, Shang-hai, and other native ports, but also to many islands of the Indian Archipelago. The duties at this town (which lies on the western extremity of a large bay) are very high, in consequence of which a small cove in Namoa island is used by many ship-masters, who anchor there, and carry on smuggling to a great amount.

This island is nearly severed by a great crevice, into which the sea runs, leaving only a narrow neck of dry land to connect the two portions. There is a town at the bottom of the bay to the east, and the country is high, stony, and almost without trees. The entrance to the harbour is difficult and dangerous, but once within, ships find it deep and spacious. There is here a military station, a mandarin, and a fort, first erected to keep away the pirates of Japan and the Chinese islands, who were wont to infest it, and make it their rendezvous. The readiest and most frequented route from Canton to Amoy for the native junks is between this island and the continent.

[To be continued.]

Of Discourse.—Some in their discourse desire rather commendation of wit, in being able to hold all arguments, than of judgment, in discerning what is true; as if it were a praise to know what might be said, and not what should be thought. Some have certain common places and themes, wherein they are good, and want variety; which kind of poverty is for the most part tedious, and, when it is once perceived, ridiculous. The honourablest part of talk is to give the occasion; and again to moderate and pass to somewhat else, for then a man leads the dance. It is good in discourse, and speech of conversation, to vary and intermingle speech of the present occasion with arguments, tales with reasons, asking of questions with telling of opinions, and jest with earnest; for it is a dull thing to tire, and as we say now, to jade anything too far. As for jest, there be certain things which ought to be privileged from it; namely, religion, matters of state, great persons, any man's present business of importance, and any case that deserveth pity.—*Lord Bacon's Essays.*

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STEAM NAVIGATION.

[The British Queen, Steam-Ship.]

The alliance of steam with the press, the ship, and the railway-carriage, is a power which has only been introduced into the world within the recollection of the present generation. Can there be a doubt of the vast influence which this triple connection must exercise upon the future destinies of mankind? or is there a more magnificent subject for speculation than the triumphs of civilization and knowledge which will be the result of this confederation of the highest elements of social progress—knowledge, commerce, and the facilities of intercourse—over all the kingdoms of the earth? Is a barbarous country like Africa to be won from the moral darkness which overshadows its vast surface,—what more potent agent for effecting this object than the steam-ship which carries the white man into the heart of the country, and renders the great rivers by which he penetrates the tributaries of religion, peace, and commerce? In a country whose inhabitants have already conquered the physical difficulties of the soil, and who have rendered every part of it fertile and pleasant, who already acknowledge the advantages of law and order, but whose intellectual faculties are benumbed by some benighting influence,—there may the steam-press be set to work to awaken them from their torpor and to impart higher views of the intellectual dignity of man. To such a country as England the railway steam-carriage will afford advantages not less important in the circumstances in which she is placed. Every railroad which renders the chain of rapid communication more complete and extensive, adds, we may hope, so much power to the force of truth and the consequent extinction of error, and leads the way to a higher moral and physical condition of the community.

The first efficient steam-vessel was launched in the United States of America, on the Hudson, by Fulton, in 1807; and in Great Britain it was not until 1812 that Henry Bell's little steam-boat of three-horse power began to ply on the Clyde between Glasgow and Greenock. In 1814 there were not a dozen steam-vessels in the United Kingdom. Now they are to be found within the waters of every civilized part of the world and swarming on every considerable navigable river. Commercial intercourse is extensively carried on by their means on the coasts and countries bordering the Irish Channel, the German Ocean, the Adriatic, the Mediterranean, the Black Sea, the Baltic; and an increasing trade and traffic are occasioned by the certainty and speed with which they are navigated on these seas, as well as on all the great European rivers, the Rhine, the Elbe, the Danube, the Thames, the Humber, the Mersey, and the Severn. They have effected perhaps greater results in Ireland than any legislative measures which have ever been enacted in connection with that country. It is scarcely sixteen years since the first vessel carrying merchandise plied across the Irish Channel during winter; and two years ago the City of Dublin Company had a fleet of twenty-one first-rate sea-going steamers, propelled by engines of 5550 aggregate horse-power. The intercourse which is now established between Great Britain and Ireland renders it utterly impossible to avoid the prompt application of measures of political amelioration, which but for this cause might have been neglected or delayed.

England and the United States of America have kept far ahead of all other countries in the energy with which they have availed themselves of the advantages of steam navigation. At present there are about eight hundred steam-boats of all sizes in the United Kingdom, and in the United States there are perhaps at this time a still larger number. The number built in the United Kingdom is sometimes seventy or eighty each year; and about five years ago the total number was six hundred, which had increased at the end of 1838 to seven hundred and sixty (exclusive of those not registered), namely :—

No. of Vessels.	Average Tonnage.	Average Horse-Power.
256	66	25
145	122	47
84	211	90
63	287	120
76	361	147
41	532	266
10	769	300

It was estimated that the number of river steamers and small coasters was four hundred and eighty-four, and that there were two hundred and eighty-two large coasters and sea-going ships. Nearly two hundred were registered or ascertained to belong to the port of London; nearly sixty were plying on the Humber, Trent, and Ouse; and above eighty on the Mersey.

From a Report made to Congress at the end of 1838, it appears that since the introduction of steam navigation 1300 steam-vessels had been built in the United States, and of this number two hundred and sixty had been lost and two hundred and forty worn out. The total number in service was consequently eight hundred. In 1834 the number of steam-vessels built in the States was eighty-eight, and in 1837 there were one hundred and thirty-four built. On the western and south-western waters, where not a single steam-boat had appeared in 1811, and only two hundred and thirty-four in 1834, there were four hundred constantly plying at the end of 1838; and seventy were employed upon the north-western lakes. With the exception of the latter and a few on the Atlantic coast, which are fitted out like sea-going vessels, the American steam-boats have neither masts nor sails, and the machinery and cabins are usually raised above the decks. Those which ply on the Hudson and on the eastern waters are remarkable for their enormous engines and the great speed which they maintain, the rate being occasionally sixteen and a half miles per hour; and the voyage from New York to Albany, a distance of one hundred and fifty miles, is performed in ten hours, including stoppages to take in and land passengers. A few iron steam-boats are used on the shallow waters. The largest steam-boat in the United States in 1838 was the Natchez, of eight hundred and sixty tons, with an engine of about three hundred horse-power. The Illinois and the Madison, plying on Lake Erie, were of seven hundred and fifty tons and seven hundred tons. Wood was at first commonly used as fuel, but bituminous coal, and in some instances anthracite, is superseding this material in many parts of the Union.

In 1835 the number of steam-boats in France was only one hundred, and in 1836 only five were added to this number; but the government had forty steam-vessels, twenty of which were employed in the Mediterranean.

In the spring of 1838 a new era commenced in the history of steam navigation, when the Great Western steam-ship and the Sirius made the passage across the Atlantic, the former from Bristol in fifteen days, and the latter from Cork in nineteen days. It is true that a steam-vessel had crossed the Atlantic before, but the dependence upon steam power was not complete in the instance of the Savannah, which made the voyage from New York to Liverpool, in 1819, in twenty-six days. In 1828 also the Curaçoa, an English built vessel, with two engines, each of fifty horse-power, proceeded from Holland to the Dutch West Indies; and several years before the voyage of the Great Western, the Enterprise steam-ship made the voyage to India. These were but solitary efforts, and it is only since April, 1838, that the problem of steaming across the Atlantic has been practically settled and become a permanent mode of transport. The mails from Falmouth to the Mediterranean had been regularly conveyed by steam-ships for seven or eight years before, but from the performance of these vessels it was assumed that no vessel could calculate upon making a voyage exceeding two thousand miles with any quantity of fuel which it could be made to carry; and, notwithstanding the great improvements which had been constantly taking place in adapting steam-machinery to sea-going vessels, yet a permanent and profitable communication between Great Britain and New York was still deemed (in April, 1837), by a well-known man of science, as "in a high degree improbable," and it was stated by him that the extreme limit of a practicable steam passage would be from the western coast of Ireland to Halifax, a distance of about two thousand two hundred miles; to perform which the average time required would be nineteen days. In April, 1838, however, the Great Western left Bristol for New York, a distance of three thousand five hundred miles, and in fifteen days she landed her passengers at New York. The Sirius, which had sailed from Cork four days earlier, and was not expressly built for the voyage, arrived the same day. The whole population of the city was thrown into a state of excitement and enthusiasm, arising in no small degree from the emotions which connected this great triumph with the fact that it had been accomplished by men of the same energetic race as themselves. This event will be dwelt upon with pride when the valley of the Mississippi and the prairies of the far West teem with millions of the great Transatlantic Anglo-Saxon people.

At her departure from Bristol on her first voyage, the Great Western had on board six hundred and sixty tons of coal, of which only four hundred and fifty-two tons were used when she reached New York. In several of her subsequent voyages the average consumption of coal has been twenty-seven tons per day, and, allowing one hundred tons to each eight hundred miles, it would have been quite possible, with the two hundred tons remaining on her arrival at New York, to have proceeded sixteen hundred miles farther; thus making a voyage exceeding five thousand miles. One of the homeward voyages of this vessel has been made in twelve days and a half, from New York to Bristol, a rate equal to eleven miles and two-thirds of a mile per hour, or two hundred and eighty miles per day; and she has performed eight miles and three-quarters with a gale directly ahead. The length of the voyage out and home may be estimated at from twenty-seven to thirty days. The average rate of those splendid sailing-vessels called the "Liners," out and home, between New York and Liverpool, was fifty days, the time occupied by one of the old line of packets averaging fifty-seven days. The Great Western landed one hundred and fifty-two passengers on her voyage from New York in July last. The officers, crew, and engineers are about sixty in number, and accommodation could be provided for nearly one hundred more passengers. The saloon is seventy-five feet long, twenty-one broad, exclusive of recesses on each side, where the breadth is thirty-four feet and the height nine feet. The decorations are in the highest degree tasteful and elegant, and the apartment may vie with those of the club-houses of London in luxury and magnificence. The splendour of a saloon is, however, a matter of very inferior consequence, and it is higher praise to state that the more essential parts of the vessel and all her machinery are examples of mechanical skill and ingenuity which cannot be surpassed.

The British Queen is another ocean-steamer, built at a cost of one hundred thousand pounds, for the passage across the Atlantic. She was launched on the Queen's birth-day in 1838, and made her first voyage from London to New York last year. The President, another great steam-ship, is at this moment just on the point of making her first voyage to the United States. The Liverpool is employed between Liverpool and New York, and made her first voyage in the same year that the Great Western accomplished her first passage. The following table shows the dimensions of the hull and machinery of three of these ocean-going vessels :—

Dimensions.	Great Western.	British Queen.	President.
Extreme length . feet	236	275	265
Ditto under-deck „	212	245	238
Ditto keel „	205	225	220
Breadth within the paddle-boxes . . „	35 4 in.	40	41
Ditto, including do. „	59 8 in.	64	64
Depth of hold at midships . . . „	23 2 in.	27 6 in.	23 6 in.
Tons of space . „	679⅘	1053	—
Tonnage of engine-room „	641½	963	—
Total Tonnage . tons	1321	2016	1840
Power of engines horses	450	500	540
Diameter of cylinders, inches	73	77½	80
Length of stroke . feet	7	7	7½
Diameter of paddle-wheels . . „	28 9 in.	30 6 in.	31
Total weight of engines, boilers, and water . . tons	480	500	500
Total weight of coals, 20 days' consumption „	600	750	750
Total weight of cargo „	250	500	750
Draught of water with the above weight of stores . . . . feet	16 8 in.	16 7 in.	17

The government has made a contract for several large ocean-steamers, which are to convey the mails to the West Indies and to other colonial dependencies; and in two or three years the most distant quarters of the globe will thus become more intimately connected with the main sources and springs of civilization and enterprise.

The total number of steam-vessels in the world is probably about two thousand, and of this number four-fifths belong to England and the United States. This power became of vast extent before time and experience could point out the laws which were necessary for its due regulation, and for guarding against those casualties peculiar to its nature. In addition to the ordinary perils of the sea, steam-vessels are exposed to the danger of explosion and the accidents arising from defective machinery, to fire, and to collision with other vessels. The time has, however, now arrived when the observation of a few simple regulations by steam-boats should be compulsory on all persons connected with this class of vessels, by which means the loss of life would be no greater, nor perhaps so great as in ordinary sailing craft, over which they have in some measure an advantage, as in the power of keeping off a lee shore, on which the force of the winds would drive a sailing vessel.

From a Report made to the Board of Trade, in 1839, it appears that in the preceding ten years the number of steam-boat accidents in the United Kingdom, as far as their number could be ascertained, was ninety-two, namely: forty wrecked or foundered, involving a loss of three hundred and eight lives; twenty-three explosions of the boilers, by which seventy-seven lives were lost; seventeen fires from various causes, only two lives being lost; and twelve collisions, by which sixty-six persons perished. The loss of life in a crowded river, like the Thames, occasioned by steam-boats, or which occurred on board, amounted to forty in three years; and the total loss of lives attributable to steam-boats in the ten years, and including all parts of the United Kingdom, was six hundred and thirty-four. In the wreck of the Rothsay Castle, one hundred and nineteen persons perished; in one case of collision sixty-two, and in one of explosion twenty-four persons lost their lives.

The want of experience, science, and attention has occasioned still greater loss of life in the steam-boats in the United States of America. In the Report to Congress, already quoted, it is stated that to the end of the year 1838, there had been ninety-nine cases of boilers exploding; twenty-eight of fire; fifty-two cases in which the loss of the vessel was occasioned by "snags" and "sawyers" in the rivers. The aggregate loss of life from these various causes was estimated at two thousand, and by many the number was thought to be much greater. The number of persons perishing in single casualties was also much greater than in England. In 1837 the Monmouth came into collision with another steamer on the Mississippi, when three hundred lives were lost. By the explosion of the Oronoco, on the same river, in the same year, one hundred and thirty lives were lost: again, in the same year, also on the Mississippi, the Ben Sherrod took fire, and nearly one hundred and thirty persons perished. In the same year also the Home was shipwrecked on the coast of Carolina, and one hundred lives were lost.

The adoption of even so simple a rule as that which is observed by carriages on the public highway would alone have prevented many accidents in both countries, and an inspection of the machinery by authorised persons would probably be a wise safeguard. There appears indeed to be no reason why steam-vessels should not be a safer means of water-transport than any other.

Arabs in Mesopotamia.—Whatever virtues the Arabs of former times may have possessed, it is to be feared that few have descended to their progeny of these degenerate days, at least in those parts to which Europeans have had access. As the iniquitously acquired knowledge of our first parents opened their eyes to their nakedness, so the perception of his comparative poverty has awakened in the Arab's mind a craving for riches,—a feeling which is directly subversive of the practice of either hospitality or generosity; because the easiest way—indeed, the only way—for one of his habits to acquire them, is by force and rapine, by taking the property of others; and, accordingly, the existence of these virtues is found proportionably rare. The same may be said of integrity and fidelity. The man who is unscrupulous as to the means of acquiring riches will pay little regard to his promises or oaths. Accordingly, nothing is more common than instances of Arab faithlessness and treachery. The sacred tie of "bread and salt" becomes an empty form which is easily evaded. The pledge given by one chief is disregarded or broken, when it suits his purpose, in the person of his brother or his uncle, who declares his own independence and right of plunder; and we hear even of a host, after entertaining travellers as his guests, and guarding them in safety on their journey to a prescribed point, himself waylaying and stripping them. Courage, like many other qualities, is the child of circumstances, and flourishes in proportion as these call it forth. The stout resistance of the Ben-i-boo-Allee tribe to the British arms at Rausul-Khymah, the determined courage of Arab mercenaries in India on many occasions, and the daring (though often atrocious) exploits of the Wahabees, may serve as proofs, among many others that might be quoted, of Arab gallantry; yet so much is the reverse the case in the countries we are now speaking of, that the cowardly yet bullying character of the Arabs is notorious.—*Fraser's Travels in Koordistan.*

In all contentions between wit and violence, prudence and rudeness, learning and the sword, the strong hand took it first, and the strong head possessed it last.—*J. Taylor.*

DRUIDICAL REMAINS.—No. II.

[Continued from No. 535.]

[Druidical Circle.—Jersey.]

We now proceed to inquire what information we possess as to the origin and use of the circles of stone, on which points the Scriptures furnish us with many indications. The first positive mention of them in the sacred writings occurs not long after the delivery of the law from Mount Sinai, when the Israelites entered into a solemn covenant with God, and when Moses, to commemorate the event, built an altar of earth at the bottom of the mountain, and erected around it twelve stones, one for each of the twelve tribes. But a more striking example is that of the twelve stones taken up out of the bed of the Jordan, and set up in Gilgal. The object was then declared, "That this may be a sign among you, that when your children ask in time to come, saying, What mean ye by these stones? then ye shall answer them, The waters of the Jordan were cut off, and these stones are for a perpetual memorial to the Israelites."* The name Gilgal (a circle, a round, a wheel) seems evidently borrowed from the arrangement of the stones. At this place, thus rendered sacred as a memorial of the Divine support, we afterwards find all the more solemn acts of public business—religious, legislative, deliberative, and political—transacted. In the first book of Samuel† it is said, "he went from year to year in circuit to Bethel [the place where Jacob set up a stone to commemorate his vision], and Gilgal, and Mizpeh [where stones were set up by Jacob and Laban in memory of their reconciliation], and judged Israel in all these places." It is worthy of notice that at all the places of judgment here mentioned, sacred stones had been previously set up. Of the holy character of Gilgal the following quotation is decisive: "Go down before me to Gilgal," says Samuel to Saul, "and behold I will come down to thee, to offer burnt offerings, and to sacrifice sacrifices of peace offerings."‡ At Gilgal Saul was inaugurated as king; before "Jehovah in Gilgal" Samuel hewed Agag in pieces; and it was here probably that the prophet Elijah resided, for we find him setting out from Gilgal with Elisha before his translation. Lastly, we find the earlier prophets directing their denunciations against the idolatrous corruptions of which Gilgal was becoming the seat. There are two incidental evidences of the originally sacred character of the circles worth mentioning, as being drawn from such very different parts of the world: one is, that Epiphanius, a native and resident of Syria, describes an open circle as a place of prayer formed by the ancient Samaritans; the other, that in Erse the name of the stone circles is *clachan*, and "going to clachan" is a phrase now commonly used among the Highlanders to express going to church. The history of Gilgal, therefore, it may be seen from the preceding remarks, is precisely what our antiquarians generally conceive to be the history of our own Druidical circles:—the immediate objects of their erection were in all probability generally connected with religious ideas or feelings; and being erected, their use afterwards for all important public purposes would be greatly desiderated, in order to invest the proceedings with the sacred character of the spot.

As the civil uses of the circles appear to have long survived the religious, we find much more precise information as to the first than as to the last. In the 'Iliad,' we find a remarkable passage very unfaithfully translated by Pope, and which is thus rendered by King, in his 'Munimenta Antiqua:' "The herald at length appeased the tumult; and the elders sat on, or at, rough hewn stones within a sacred circle." It may here be noticed, that the different height of the stones in different circles still standing in our country, would justify the use of either word *on* or *at*. At Rollrich in Oxfordshire, and near Keswick in Cumberland, some of the stones in the circles are not much above two feet high. At Stanton Drew* in Somersetshire, their height varies from eight to twelve feet in height; and at Avebury the climax was reached, where the stones were, many of them, of the height of twenty feet. Cæsar says† the Gaulish Druids (whom he describes as imitators of those of Britain, and as deriving from the latter their customs and their science) at certain times of the year sat in a certain *consecrated place*, where they determined controversies, settled disputes, and gave judicial decisions as to murder, the rights of inheritance, the boundaries of land, &c. "The Icelandic writers tell us that such circles were called domh-ringr, that is, literally, doom rings, or circles of judgment, being the solemn places where courts were held of all kinds and dignities,

* Josh., iv. 5-7 † Chap. vii., ver. 16. ‡ 1 Sam., x. 8.

* For an account of the Druidical Remains at Stanton Drew, see 'Penny Magazine,' vol. v., page 115.

† In his 'De Bello Gallico,' lib. vi.

from the national council down to the baronial court, or that of a common proprietor of land, for adjusting disputes between his villani and slaves."* In Britain the Bardic successors of the Druids preserved to a considerable extent the ideas and usages of their predecessors, as we learn from the writings they have transmitted to us. According to Mcagant, a bard of the seventh century, this race had their hill of legislation or sacred mount, where their ancient judges of the land decided the causes of the people. The following is from a poem by Cynddela: "Bards were constituted the judges of excellence, and bards will praise thee, even *Druids of the circle*, of four dialects, coming from the four regions. A bard of the *steep mount* will celebrate thee, even Cynddela." Again, "It is my right to be master of song, being in a direct line of the true tribe—a *bard of the enclosure*." Sir Richard Hoare, who adduces these passages from a curious and interesting work,† observes: "All these allusions strongly prove that the circle, the enclosure, and the mount, such as we still see at Abury, Marden, and Stonehenge, were connected first with the Druidical, and afterwards with the Bardic system, and were made use of for the joint purposes of religion and judicature. The Druids officiated in them as ministers of religion and justice. They were national edifices, constructed according to the rude fashion of the times, and at a period when the Deity was worshipped in the most simple and primitive manner, under the open canopy of heaven, not in stately covered temples."‡

Many of the stone circles (the later ones, we presume) appear to have been constructed with reference to astronomical purposes. Cæsar says of the Druids, "They taught many things to their scholars concerning the stars, and their motion, concerning the magnitude of the world," &c. According to King, certain of the perpendicular stones in many circles are carefully placed in or near the meridian of the spot, whilst others are placed as cautiously exactly to the east and west of the centre. The circles themselves are generally placed on distinguished eminences: one, situated near the high summit of Cader Idris, in Merionethshire, is, even to this day, known as the astronomer's stones or circle. We quote Sir Richard Hoare's view of the extent to which he conceives the stone circles might be used in this way, for could we but know *that* with accuracy and completeness, we should have an excellent idea of the amount of knowledge the Druids themselves really possessed of the science. "By looking along the edges or sides of two opposite stones in the circle, certain determinate points, either in the horizon or at certain elevations above it, might at fixed times be marked out: from whence an observer might be enabled to ascertain precise points in the ecliptic or zodiac; and to ascertain more easily the varying distances of the planets from certain fixed stars; and might by that means better observe their motions. At least such instruments might enable them to ascertain the identical places of the rising and setting of certain fixed stars: and to preserve the knowledge of the times of their rising and setting throughout the year; even when from their proximity to the sun they became invisible. At the same time also, by means of the different heights of the stone pillars, certain and different altitudes, both in the meridian and in azimuths, might be observed in the heavens, and though rudely, yet with some degree of precision be determined, by an observer standing at the opposite corresponding stone, on the verge of the circle (that is, at the opposite end of the diameter), and having his eye placed at a determinate height from the ground, either by means of a staff, or of some known mark in the side of the stone. They might also, by means of the combined effect of the relative position of the shadows of the several stones (which, when compared with the situation of the stones themselves, would be varying almost every minute), the more accurately distinguish the hours or portions of the day: and cause the sun and also the moon to become the more useful, for that very purpose for which, we are told in holy writ, the two great luminaries of the heavens were ordained; that is, to be for signs and for seasons, and for days and years."*

[Druidical Circle at Darab.]

It would be useless to mention even the names of the principal stone circles in Great Britain, they are so numerous, so well known, and so alike in their general character. But as an illustration of the identity of this kind of monuments wherever found with our own, we may refer to that seen by Sir William Ouseley in the province of Fars in Persia, and which is shown in our engraving. This stands near Darab, in an extensive piece of ground enclosed by an extremely wide and deep ditch, and by a bank of earth proportionably high. Some of the stones are said to be from twenty to twenty-five feet high; one in the centre is perhaps the tallest, and one towards the west resembles a table or an altar, being flat at the top, while under two or three are recesses or small caverns. Standing alone, but within the same enclosure, is the extraordinarily large upright stone shown below, which is at least twenty feet high, and is held in superstitious veneration by the natives. In every essential feature—the enclosure, the circle and the central stone, the deep ditch and high bank, and the neighbouring stone erect—this Eastern remain coincides with those of our country.

[Druidical Stone in Persia.]

HORSE ARMOURY IN THE TOWER.—XI.

SIR HENRY LEE, 1590.

Never was knight more truly imbued with the spirit of ancient chivalry than was Sir Henry Lee of Ditchley; none, not even the old Spanish knight immortalised by Cervantes, ever strove more strenuously to fan its dying embers into a flame, and to awaken to deeds of daring and danger, familiar to their ancestors, the gallant spirits

* Pinkerton, 'Description of Empires,' 1802.
† Davies's 'Mythology of the Druids.'
‡ 'Ancient Wiltshire,' p. 112.

* 'Ancient Wiltshire: South,' p. 140.

of Elizabeth's gay court, who were fast succumbing to the effeminacy of mere courtiers. Not that Sir Henry disclaimed himself the name of courtier; he was a frequent attendant at court, and participated largely in its pleasures: in a galliard, or a pavin, or a measure, or in a coranto, he would foot it with the best of them; nay, it is probable that he would not be found wanting even in the exciting movements of the French brawl. But to him such matters were only temporary relaxations; he considered the more arduous duties of knighthood the more pleasurable, as well as the more honourable, and the endeavour to convince others of the justness of his views formed the principal business of his life. Of his youth we know little. He was born about the year 1531, and probably spent his early days in the retirement of a country life, or in practising the exercises in which he afterwards so eminently excelled. After "practising tilts and tournaments," he perfected himself in military affairs by engaging in the wars in Flanders. On his return he was appointed by Elizabeth master of the armoury, and in this capacity he formed a Society, consisting of twenty-five of the most distinguished gentlemen of the court, for the purpose of instituting annual exercises of arms in honour of the queen, for whom he constituted himself champion. He held the proud distinction of champion or president of this society for several years, till at length, finding old age creeping upon him, he determined to resign in favour of George earl of Cumberland, who was consecrated president and champion to the queen, with great ceremony, on the 17th of November, 1590, the anniversary of the queen's accession.

Besides the brief notices of this ceremony detailed by our historians, there was published at the time in a curious tract, by Sir W. Segur, entitled 'Honour, Military and Civil,'* a full account of the whole proceedings, to which a large chapter of the work is entirely devoted. From this we are enabled to present our readers with a "full, true, and particular account" of the imposing ceremony. The scene of the events about to be recorded was the Tilt-yard at Westminster. Although in the month of November, the day was extremely serene, while the sun, darting its rays on the windows of the old Abbey, lighted up the building, and brightened the walls of the magnificent hall, not, as now, blackened with the smoke of a populous neighbourhood, but retaining still much of its original freshness. As the fête, for such it was, was to open with jousts and tournaments, the citizens of London, eager to escape for awhile from the smoke and business of the city, were at an early hour flocking to the scene, where galleries had been erected for the accommodation of the spectators. Except in those set apart for the nobility, for the lord-mayor and sheriffs, and for others whose rank or connection with the sports entitled them to such a distinction, seats in these galleries might be procured on the production of that very general passport a gold piece. For some indeed, in the best situations, it was necessary to produce more than one of these passports, but the excitement was so great that they were readily given for the accommodation.

These galleries, consisting each of several tiers of seats, extended all round the Tilt-yard (occupying the site of what is now called Palace-yard); but long before the hour appointed for the sports to commence, they were crowded with spectators, many of whom had arrived at an early hour in the morning with the intention of securing a good place, and of waiting patiently for the events of the day. But, as usual on such occasions, they had greatly miscalculated their powers of patience and endurance, and a few quarrels, got up for the purpose of passing the time more agreeably, now and then called for the interference of the yeomen-at-arms. But these were all settled peaceably, the parties having made themselves only just sufficiently angry to allow them to forget the long time they had been waiting impatiently inactive; and we believe no serious tumult disturbed the harmony of the day.

When the time arrived for the queen to make her appearance, the scene was extremely enlivening, from the gay appearance of the galleries surrounding the lists, covered with coloured cloths fringed with gold, the splendid dresses of the ladies, and the no less sparkling costume of the gentlemen—for in those days *black* was not the uniform worn by the men on galas like these, but dresses of silk and satin, enriched with gold and silver embroidery and precious stones; dresses, in short, adapted to a gay festival, and awakening no unpleasant remembrances of funerals and mourning. Then the feathers attached to their caps waved in the air and fluttered in the breeze, giving an appearance of motion to the whole field of view. In the background the houses and trees were crowded with spectators, and even the masts of the barges and other vessels on the river were decorated with some living specimen of the genus *homo*. Amidst all this crowd the partizans of the soldiery glittered here and there, and awed the multitude into good behaviour; while the martial music proceeding from the tents of the challengers to the approaching tilt, seemed to give a voice and tune to the deep hum of the assembled mass of human beings, which came over the field like the bass accompaniment to the music.

We should delay too long the main business of the day were we to attempt to give any account of the tilt and of the various successes of the combatants; it will be only necessary to observe that the queen, seated under a canopy opposite the entrance to the hall, and surrounded by courtiers and maids of honour, graced the day with her presence; that the knights, habited in armour richly engraved and gilded, appeared in the field with devices of the most grotesque and imaginative character; that they did their devoirs gallantly, and to the admiration of even the precise criticism of the heralds; and that the people were rapturous in their plaudits at every well-run course, and seemed to be pleased with everything except the fact that none of the knights sustained any injury.

At the termination of the jousts, in which Sir Henry Lee had well performed his part, that worthy knight presented himself at the foot of the stairs leading to the queen's gallery, with the intention of signifying his resignation of his post in favour of George earl of Cumberland. The quaint pamphlet of Sir W. Segur describes an incident which now took place, "at which everybody greatly marvelled;" for "the earth sodainely as it were opening, there appeared a pavilion of white taffaty set upon pillars of porphyry arched like unto a church, with many lamps burning," and having the roof fretted with rich Gothic work and gilding. In this pavilion, or chapel, or temple, for by all these names was it designated, there was an altar covered with cloth of gold, and lighted by two large wax candles in rich candlesticks. On this were deposited "certain princely presents," one of which was a veil curiously wrought and adorned with a border of precious stones, to be presented to the queen as a parting memorial from the knight now resigning his honourable office. Before the temple a pillar had been erected, entwined with an eglantine tree of gold, and surmounted by a crown.

As Sir Henry Lee drew near to the queen's throne some musicians stationed in the temple sent forth a strain of enchanting sweetness, whilst Mr. Hales, "her majesty's servant, a singer, and a gentleman in that art excellent, and for his voice both commendable and admirable," accompanied it with the following words, supposed to be addressed by Sir Henry Lee to the queen:—

"My golden locks time hath to silver turn'd
(Oh, time too swift, and swiftness never ceasing);

*Reprinted in Nichols's 'Progresses of Queen Elizabeth;' and in Walpole's 'Miscellaneous Antiquities,' No. 2.

My youth 'gainst age, and age at youth hath spurn'd;
But spurned in vaine—youth waineth by encreasing—
Beauty, strength, and youth, flowers fading beene,
Duety, faith, and love are rootes and ever greene.

My helmet now shall make an hive for bees,
And lovers' songs shall turne to holy psalms;
A man-at-arms must now sit on his knees,
And feed on prayers that are old age's almes.
And so from court to cottage I depart,
My saint is sure of myne unspotted hart.

And when I sadly sit in homely cell,
I'll teach my swains this carrol for a song:
Blest be the heartes that think my sovereign well
Cursed be the soules that thinke to doe her wrong.
Goddesse, vouchsafe this aged man his right,
To be your beadsman now, that was your knight.'

At the conclusion of this song, Sir Henry advanced, and laid the veil, with other costly gifts, at her majesty's feet, together with a cloak and safeguard set with buttons of gold, on each of which was engraved the device of a distinguished friend, and on the lowest the sign "&c.," "inasmuch as all his friends could not be included in so few designs." He then repeated the burden of Mr. Hale's speech or song, and declared that although his youth and strength had decayed, his duty, faith, and love remained perfect as ever; his hands, he said, "instead of wielding the lance, should now be held up in prayer for her majesty's welfare; and he trusted she would allow him to be her beadsman, now that he had ceased to incur knightly perils in her service." But the queen complimented him upon his gallantry, and though she allowed him the indulgence he prayed for on account of his age, she desired that he would attend the future annual jousts to direct the knights in their proceedings, "for indeed his virtue and valour in arms were declared by all to be deserving of command."

Sir Henry Lee then presented the Earl of Cumberland to the queen, and kneeling on one knee, humbly besought her majesty to accept the earl for her knight, to continue the yearly exercises, which he was compelled, from infirmities of age, himself to relinquish. The queen graciously accepting the offer, the esquires of the old knight presented his armour at the foot of the throne; while he put on his own person a side-coat of "black velvet, pointed under the arm, and covered his head (in lieu of a helmet) with a buttoned cap of the country fashion." He then assisted in fastening on the armour of the earl, and mounted him on his horse, amidst the discharge of artillery, the strains of martial music from the temple, the cheers of the nobles, and the loud huzzas of the people.

Thus closed the public career of this honourable gentleman and gallant knight, pronounced by Mons. de Champigny (ambassador from Holland to Queen Elizabeth) "the most accomplished cavalier he had ever seen." The leading traits of his character, in his latter days, are probably accurately delineated by Sir Walter Scott, in 'Woodstock,' in which he is introduced with great effect, though not in strict accordance with chronological accuracy, since Sir Henry died some years before the events recorded in that novel are supposed to have taken place. The hint for another principal character in the same work, the dog 'Bevis,' was probably taken from an incident in the life of Sir Henry recorded by his contemporary, in which his life was saved by the sagacity of a faithful hound, who being one night in the knight's chamber when one of his servants came to rob and murder him, seized the man by the throat, and saved his master. This animal is represented in two portraits of Sir Henry Lee, one mentioned by Walpole, the other formerly in the possession of Mrs. Sidney Leigh, of Chester, engraved in Pennant's 'London.'

Sir Henry Lee died in 1611, at the age of 80, and was buried in the church of Quarendon, near Aylesbury.

SKETCHES OF THE COASTS FROM SINGAPORE TO PEKIN.

V.—COASTS OF QUANG-TONG AND FO KIEN.

[Continued from No. 535.]

The other ports of Tchaou-tcheou-foo, besides Ching-hai, are Ampoh or Gan-po, Hai-ho or Hai-yang-hien, Kit-co or Kee-yang-hien. There is a port also at the entrance of the Taou-ping river called Soakah or Shan-keo, much frequented by small craft (on account of the shallowness of the river's mouth) from Ching-hai. Shin-tseun is also a walled town, situated on the left bank of a considerable river much frequented by fishing-boats. The inhabitants of all this district are over-crowded, in consequence of which great distress generally prevails. The authorities are held in some contempt; insurrections are frequent; and numerous forts and walled places have been built to overawe them. Among these is that near Cup-chee (in the mandarin's dialect, Kea-tze), partly cut out in the solid rock. It is situated at the bottom of a bay, the entrance of which is guarded by junks. Villages built of brick, amidst overshadowing trees, adorn the shore, the character of which all around is boldness and ruggedness. To the right of the town are extensive salt-works, consisting of an elevated bed of mud, where the sea-water is partially evaporated.

The general aspect of the coast is barren and arid in the extreme. Scarce any rice is cultivated, but wheat, Barbadoes millet, and various kinds of vegetables, but especially the sugar-cane, are reared. Sugar indeed and salt form almost the only articles of export.

The excess of population above alluded to is so great that emigration is constant to our settlements in the Straits and to Borneo, where the Chinese are exclusively employed to work the mines. This is also the case in Fo-kien, whence vast numbers pass annually to Formosa or to Hainan, or are spread through Quang-tong province as barbers or servants. This superabundance of population has always been remarked, and the people have necessarily from this cause become maritime. Another but subordinate motive has been their distance from the course of inland water-communication with Pekin and the neighbourhood of Formosa, which has been called the granary of China. Among other of their imports from that island is sugar, which they sell northward at Ning-po, Shang-hai, Teen-sin, and the maritime towns of Manchow Tartary, where they take in cargoes of peas and drugs.

The two places of most commercial importance in Fo-kien (the neighbouring province to Quang-tong), are Amoy and Fou-tcheou-foo. The latter is situated on the banks of a river which is entered by a passage of similar nature and name (Woo-foo-moon), to the Bocca Tigris. There are on either side ruined forts, which, though useless in a military point of view, add considerably to the picturesqueness of the scene. The river holds on a winding course between wide amphitheatres in the mountains cultivated in terraces to the very summit, and suddenly in the vicinity of Mingan (twelve miles from Woo-foo-moon) contracts to a channel of not more than a quarter of a mile, on each side of which the rocks rise precipitously to a height of several thousand feet. Here the scenery is highly beautiful: the rocks, shooting upwards like a wall from a long fringe of trees that wave their pendulous branches over the stream, appear almost to touch the blue canopy of the heavens; whilst beneath, many a sail and many a painted boat, crowded with passengers or loaded with the rich produce of the Indian Archipelago, slowly stem the current or dart, impelled by wave and oar towards the sea.

A few miles above Mingan the wall of mountains recedes, and the river divides into two branches. Following that flowing from the north, with a narrow plain, like the valley of the Nile, of the richest alluvial soil, luxuriant with vegetation on either side, a gay forest of

masts, fairy pagodas, and elegant country-houses with tiles of bright blue sparkling in the sun presently announce the vicinity of Fou-tcheou-foo (nearly five miles from the sea). Here the bridge across the river has thirty-three arches and is four hundred and twenty yards in length by fourteen wide. A considerable portion of the latter is occupied by temporary shops, and the bridge is really a very fine sight, although it falls far short of the description of Du Halde, in whom it has a hundred arches. In nothing perhaps have the Jesuits exaggerated so much as in their accounts of the Chinese bridges. That at Chin-Cheu was by them said to be eleven hundred paces in length, built without arches, of a deep blue stone, &c. Other bridges of single stones have been celebrated by them, but more modern research has scattered the illusion, and most of the Chinese bridges have dwindled into long causeways. In general the characteristic of a Chinese bridge is not solidity but prettiness, and as labour is of little value, the slightest materials are often fashioned with the most scrupulous care. In the youth of nations men rear stupendous buildings destined to be co-lasting with the state itself, but in their old age toys are their only productions, as though the slightest edifices would last the few years they have to endure. This latter principle now governs all their undertakings, and the grand canal (opened about A.D. 1280), were it not continually repaired, would soon demonstrate this theory by sweeping away the contemptible barrier of earth and rubbish which now confines it, whereas the boundary wall, built when the empire was just emerging from obscurity near two thousand years ago, still subsists, and if it be partially ruined, it is because the empire it was raised to protect is fast sinking to decay.

Fou-tcheou-foo is particularly celebrated for its extensive commerce, the fertility of its environs, and the magnitude of its river, which wafts the largest junks to its very walls. The hills around it are covered with cedar, orange, and olive trees, and far to the north a tall range of mountains forms the division of the province from that of Che-Kiang, the road to which passes through a defile defended by a gate and a numerous guard of soldiers.

The sugar made at this town is excellent, and dried fruits are exported thence to all parts of the empire, among which is a delicious species of orange, whose pulp, easily loosened from the skin, has the flavour of the muscadine grape and is admirable for preserves. But the principal trade is with Che-Kiang, numberless vessels from whose ports arrive daily, to fetch black cloth, sails, wood, timber, and tobacco. Tea also, the staple produce, though not a legal article of export, is carried away in spite of all prohibitions, for the mandates of his imperial majesty are not disobeyed by Europeans only.

Besides the articles above mentioned, the province of Fo-kien produces musk and precious stones, silk and cotton; iron also, and mercury and pewter, but as to the gold and silver which its hills are supposed to contain, there is an express prohibition to prevent their being sought for. This prohibition however does not seem to extend to all the provinces, for silver mines are worked in Yun-nân, great quantities of which were, until lately, brought to Lintin to exchange for opium.

The mountains are nearly everywhere cut into amphitheatres and terraces one above another, which in some places are entirely devoted to rice-cultivation, the requisite water for which is raised through long pipes of bamboo passing up the sides of the hills and projecting across glens and gullies in the mountains. These bamboos are also used by the Chinese to make chairs and tables, and grow along the many rivers, watercourses, and streams with which the province abounds.

Fo-kien is the smallest but the richest of all the provinces of China, for not only are there here to be met with most of the productions found in other parts of the empire, but its extensive commerce with Japan, the Philippines, Formosa, &c., contributes to increase its riches.

One of its ports is Chin-Cheu (in lat. about 24° 54′ N. and long. 118° 40′ E.). The town and harbour lie at the bottom of the bay, on the western side. The harbour is cut off from the bay by a long narrow neck of land, from which a lofty square pagoda rises. Over this the crowded masts of the trading junks appear, showing that the place is one of no mean trade. One of the principal articles of export is sugar-candy, for the manufacture of which the place is famous. This sweetmeat is sometimes sold in powder, when it is adulterated with a peculiar species of gypsum esteemed wholesome by the Chinese.

But the port most known to Europeans is Amoy, where also a very extensive native commerce is carried on. The harbour or road is protected from all winds, partly by the mainland, partly by the island Amoy, and partly by other lofty islands, one of which is very curious, being perforated like a vast window and showing the seas and the rocky coast beyond. On the large island there is a temple looking towards the harbour. It is situated on a small turfy plain, sloping in front to the sea and behind towards lofty mountains. Before it lies the vast and deep sheet of water in the harbour flowing through numerous channels and surrounded on all sides by the richest verdure. There are several other pagodas on the island, among which is one very remarkable, known by the name of the Pagoda of the Ten Thousand Stones. It stands on the brow of a hill, and around it are scattered innumerable rocks and stones of all sizes and shapes confusedly disposed as though they had been showered there from the clouds. In these the bonzees have worked many caves and grottoes and pleasant covered seats for their own recreation. The whole has an air of rural simplicity which, contrasted with the usual gaudiness of Chinese works, is exceedingly pleasing and delightful. In another part of the island is a rocking-stone, of about forty tons in weight, yet moveable by the slightest touch.

Tchang-tcheou-foo is situated on a river flowing into the bottom of the bay of Amoy. Below it is a bridge of thirty-six arches with a double row of shops and houses. This town has sensibly increased in riches and importance since the colonization of Formosa, whence it imports, among other articles, sugar, rice, and camphor; indeed without that island the population would be starved; but as this is an opening for their enterprising spirit, the Amoy merchants are continually increasing in riches. Such as cannot set their capital afloat at home visit all the principal cities of the empire, from whence they either send large remittances or return annually with the profits, in order that in their old age they may come to die in their native land; for whatever honour or riches a Chinese may obtain, he counts them as nothing if he cannot return and enjoy them in his birth-place.

Tchang-tcheou was one of the cities that held out longest against the Tartars upon their conquest of China. It was taken by the invader, but recovered by Koshinga, who however again lost it after a bloody siege. The principal street is adorned with triumphal arches, and it is strongly walled. The town on the island Amoy is also fortified and strongly garrisoned. In the year 1645 the Dutch landed and attempted to take the place by treachery and surprise. They succeeded in entering the town with three hundred men, but spreading about and making too free with intoxicating liquors, the inhabitants, who had fled, returned and put them all to the sword. The Chinese have an inscription on the face of a smooth rock at the entrance of the harbour to commemorate this event.

[To be continued.]

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THE ABBEY AND CHURCH OF ST. ETIENNE, AT CAEN.

[The Abbey of St. Etienne (Stephen), Normandy.]

The abbey of St. Etienne (or St. Stephen) was the second of two magnificent religious houses founded by William the Conqueror and his wife at Caen, to appease the ecclesiastical power, which he had grievously offended by his marriage with Matilda. It was built upon some ground purchased by the duke, east of the city, and on the site, it is believed, of a previously existing chapel and royal mansion. The works were commenced a little after those of the abbey of Sainte Trinité (the other religious foundation to which we have alluded), but carried on much more slowly, for William at the time was meditating the conquest of England, an expedition demanding nearly all his means.

In 1070, Lanfranc, a celebrated monk, and prior of the abbey of Bec, was named the first abbot of St. Etienne, and charged with the superintendence of the building. On the conquest of England, Lanfranc was made archbishop of Canterbury, and William Bonne-Ame appointed to succeed him in the abbey. He finished the works, and in a manner that fully justified the trust reposed in his hands. The consecration took place in 1077, and was attended with all the pomp and splendour that the genius of the time could devise, and in the presence of an immense concourse of prelates and distinguished persons. In order to render the ceremony more imposing, William caused to be brought from Besançon the reliques of St. Stephen, whom he had chosen to be the patron of the new monastery; and, according to the historians of the time, various miracles took place in consequence, on the occasion. Rights, privileges, magnificent presents, and immense estates were showered upon the abbey, whilst William, in addition, set an enamelled cup, ornamented with precious stones and antique medals, upon the altar, in which the charter was contained. This cup, with other valuable articles, such as his crown, sceptre, &c., William bequeathed to the monastery at his death.*

Of the original habitations of the monks there are now no remains; but it is well known that they were large and magnificent. The only buildings of this character that yet exist are but restorations. Such is the edifice

* This cup is still in existence, and belongs to M. l'Abbé de la Rue, author of 'Historical Essays on the City of Caen.' In diameter it is about eight inches, of a vase-like form, standing upon a foot or pedestal, is decorated with precious stones, with forty Roman medals, and one Grecian, which forms the bottom of the vase.

vulgarly called Duke William's palace, and such is that known by the name of the Hall of State. Amongst the venerable ruins of the abbey, this last building chiefly attracts the attention of the curious. Its form is an oblong square; it is lofty, and has octagonal turrets at the four corners rising to the top of the building, where they are crowned by elegant lanterns. The windows are set in lofty pointed niches, most of them now walled up. The interior consisted of two halls on the first story, one of which has been remarkable for its immense size, the boldness of its vaulted roof, the beauty of its painted windows, and the singularity of its mosaic pavement, displaying the arms or escutcheons of many old Norman families. But in the present state of the building, which is now used as a magazine, little of its former splendour is to be recognised.

The church, now used as the parish church, is still the most considerable religious edifice of the city. Much of the original structure remains unaltered; and if some parts, which have been necessarily rebuilt on account of the injuries received at different periods, take from the church its primitive uniformity of style, the variety which has resulted is valuable to the student in the history of art. It is interesting to notice the differences which prevail between the two churches of Ste. Trinité and St. Etienne, built at the same period, possibly by the same architect. The first, founded by Matilda, and occupied by the oldest and most distinguished families of the province, united to its lesser proportions more elegance and fancy, and presents a kind of elaborate study in the use of ornaments borrowed from the Moors, the Arabs, and the Saxons, a medley, the taste for which had been recently introduced into the art in Europe; the second, on the contrary, more particularly the work of the duke, and destined for the monks and people generally, develops its parts on a vaster scale, with a more manly vigorous character, and presents in the exterior all that gravity, even rudeness, of style, which we understand by the term Lombard. In the church of St. Etienne, we may say in few words, "grandeur and solidity appear to the exclusion of elegance."* St. Etienne is built in the form of a cross. It had originally three apsises,† the principal of which, at the east end, has been removed; the others were attached to the east side of each transept, and these still remain. The parts of the original building which remain to this day are the west front, which is so greatly admired for the nobleness and height of its towers, the nave, the central part of the transept, and the base of the tower, which rises above, surmounted with a short conical spire. The western front is divided by buttresses into three parts, above the outer two of which rise the towers, with their tall octagonal spires. The eastern end of the church is very magnificent, with its wide semicircular sweep, and slender turrets, having almost the air of an oriental mosque. This part was entirely rebuilt towards the commencement of the thirteenth century, and is valuable, apart from its intrinsic grandeur, as an example of the direction then taking by the architectural artists towards that period, in the fourteenth, fifteenth, and sixteenth centuries, which produced so many edifices, admirable for the lightness of their masses, the profusion of their details, and for the flexibility then first given to stone, as evidenced in the delicacy and variety of the workmanship produced. A Latin inscription on the wall records the architect of this portion of the church, which may be thus rendered:—

> "Here lies William, the very highest in the art of working in stone.
> He perfected this new work. Christ give him a perpetual reward. Amen.'

The inscription bears no date.

The interior, without losing the austere character which prevails without, is more noble and less heavy. The Roman style is the prevalent one, and the Corinthian capital is found here in almost all its purity. Vast galleries, with the openings ornamented with balustrades, extend along on both sides, which, on occasions of great public ceremonies, were seen filled with countless spectators. The choir, which is of a later date than the nave, connects itself harmoniously with the latter, and is distinguished for the richness of its tracery. It is terminated by a semicircular chancel, around which are some chapels, eleven in number. The beauty of the painted windows has been much and justly spoken of. One of the curiosities of the interior is an object of the highest interest; this is the tomb of the Conqueror, who was buried here, enclosing a portion of his body. The first mausoleum that stood in the church was raised by Robert, son of William, and his successor in the duchy of Normandy. This was of the most magnificent character. It consisted of a black sarcophagus, erected upon four pillars of white marble, upon which is a recumbent figure of the duke, clothed in royal habit, the whole enriched with workmanship in gold of the most precious kind. The coffin was opened in 1522, in the presence of a cardinal, an archbishop, and many distinguished ecclesiastics, who found the body in perfect preservation, and of a most extraordinary size. A table of copper or brass was also found, upon which was engraved an inscription relating to the great event of William's life, the conquest of England. In order to preserve the memory of this transaction, they placed the inscription on the wall, with a painting upon wood, by the most able artist of the town, representing the body in the state in which it was found. The sarcophagus was then carefully closed. It was, however, soon broken open again, and with less respectful hands. In 1562 the Huguenots pillaged and devastated all the principal religious edifices of Caen, including the abbey and church of St. Etienne, which they attacked with such fury as to leave nothing but the bare walls. The pulpits, coffers, books, &c. were burnt: they even undermined and endeavoured to pull down the central tower; nor did they spare the coffin of the duke, for they opened and scattered about its contents. Some of the bones were, however, carefully gathered together and replaced under a new cenotaph, very nearly resembling that which the Abbess Francoise de Fromlay restored about the same period over the similarly outraged ashes of Matilda, in the church of Ste. Trinité. The second tomb, removed from the choir into the chancel in 1742, was destroyed during the French revolution in 1793, and the marble only which covered it now remains.

The abbey and church have not only suffered from the causes we have mentioned, but also from the sieges and assaults which at different times have harassed the city. Thus in 1415 our own countrymen, under the command of the Duke of Clarence, seized the abbey; and when, a few days after, king Henry V. besieged the town, he placed artillery in the lower portion of the central tower of the church from whence he battered the city, which was ultimately taken by assault. The tower was so greatly injured on this occasion as to require rebuilding, and the abbey generally experienced considerable damage. In 1434 the Norman people endeavoured to throw off the English yoke; they assembled to the number of more than 50,000 men, and seized the abbey, of which they destroyed the fortifications. But opposed by the season,

* 'Description Historique et Critique, et Vues des Monuments Religieux et Civils les plus remarquables du Département du Calvados,' &c., by T. Jolimont, Paris, 1825. To this excellent work we are principally indebted for the materials of the present article.

† An apsis is the semicircular recess which invariably formed the east termination of the primitive churches, and which was borrowed from the Roman halls of justice. In the one the apsis was occupied by the bishop and the priests, in the other by the prætor and judges.

and being without provisions or artillery, the attempt failed. They retired in disorder, followed by the English, who then pillaged the monastery and church, carrying off all their moveables. Our countrymen were at last expelled from Caen, in 1450, by Charles VII., who, during the struggle, took up his position in the abbey, not much, as we may readily divine, to the advantage of the already greatly injured edifice. The abbey buildings are now used for the purposes of a college or high school.

ON GAMBOGE.

In the vegetable world there are certain trees which, from incisions made in the branches, stems, and roots, exude a milky sort of juice, which gradually hardens on exposure to the air. This juice is formed of resin and an essential oil, which are suspended by water containing gum and other vegetable substances in solution. When this juice has become solid it is called gum resin, of which there are several varieties. On the present occasion, however, we propose to draw the reader's attention to one very remarkable variety, viz. gamboge, first referring him to the 'Penny Magazine,' vol. vi., p. 435, where, in an article on sealing-wax, the chief points of distinction between wax and resin are pointed out.

Gamboge, or, as it is sometimes called, camboge, derives its name from Camboja, a river in Siam, in the vicinity of which the substance occurs plentifully. Considerable doubt has long existed as to the tree from which gamboge is procured; and it is but very recently that a botanical description of the tree has been given. The gamboge-tree is referred to the tribe of *Guttiferæ*, that is, trees whose sap concretes in guttæ or drops. The *Stalagmites Cambogioides* is a native of Ceylon, Siam, and Cochin-China, where it attains a considerable size. Its leaves are narrow pointed, its flowers yellow, its fruit of an oblong shape and of a beautiful gold colour, and the stem has a yellow bark similar to the gum resin which it produces. The districts in Siam yielding gamboge correspond generally with those affording pepper and cardamums, that is, at about the latitude of ten or twelve degrees on the east coast of the Gulf of Siam.

There are two modes by which the juice is procured. In Siam the leaves and young shoots of the tree are broken off and bruised, which causes a yellow juice to exude in small tears or drops. These drops are received into cocoa-nut shells or earthern jars, and being exposed to the heat of the sun, are allowed to thicken. The finest sort, called pipe gamboge of Siam, is formed by pouring the thickened juice into the hollow cavities of bamboo, which gives it a cylindrical form. Another portion is mixed with other substances, made up into round cakes (sometimes with a hole in the centre), wrapped up in flag-leaves, and so imported to Europe in boxes. This is called the "cake gamboge" of Siam. Mr. Crawfurd, in his 'Embassy to Siam,' says that the districts which yield this production deliver to the kings of Siam, Camboja, and Cochin-China fixed quantities of it yearly as tax or tribute.

In Ceylon, the tree from which is obtained an inferior kind of gamboge is known botanically as the *Xanthochymus ovalifolius*. The natives wound the stems of this tree with sharp stones, and the juice begins to flow slowly. It is obtained more abundantly by the application of warmth, for which purpose a number of fires are kindled near the tree. Dr. Christison states that Ceylon gamboge is not now an article of commerce in Europe, and that all that we have comes from China.

There are other trees producing yellow juices, which, by evaporation, form substances very similar to gamboge. Mr. Royle, in his 'Flora of the Himalaya,' mentions one, of which the juice, in its crude and unprepared state, is superior to every other kind, but not so permanent.

The colour of gamboge varies with the season, with the age of the tree, and with the part of the tree from which the juice is procured. Siamese gamboge is sold in pieces of various sizes: externally it is of a dirty yellowish brown colour, covered with a fine yellow powder. When broken, it exhibits a shell-like or a vitreous fracture, with a dark yellow colour.

Gamboge is rather heavier than water. It has little or no smell except when heated, and then the smell is peculiar. It has no decided taste in the mouth unless it be chewed for some time. It dissolves largely in alcohol; as also, but in less proportion, in æther; and with the former it yields a clear gold-coloured fluid, which becomes turbid on the addition of water. The tincture thus formed constitutes one of the ingredients of the gold-coloured lacquer which so much improves the appearance of smaller articles of brass-work. It also enters into the composition of gold-coloured varnish, with which many of our manufactures in white wood are overlaid. It is also used to stain wood in imitation of box-wood; and is said to have the effect of imparting a beautiful and tolerably durable yellow stain to marble.

Gamboge is not, properly speaking, soluble in water, but is diffusible, forming therewith an emulsion, in which the resin is suspended by the gum: in this case it is of an opaque yellow, and is largely used as a water-colour pigment. Gamboge is soluble in alkaline solutions, and the resulting compound is not rendered turbid by water; it is, however, instantly decomposed by acids, and the precipitate thus formed is of an exceedingly brilliant yellow colour. Gamboge is fusible and inflammable: when ignited, it blazes, throws out sparks, and emits a dense black smoke.

A remarkable appearance is presented by a drop of the aqueous infusion, or of the alcoholic solution of gamboge, when viewed through a microscope of tolerably high power. The drop exhibits an immense number of minute particles moving about with great and unceasing velocity as if endued with life: this appearance is most striking with a drop of the tincture containing a slight excess of gamboge. This phenomenon we do not profess to explain, but it closely resembles the rapid rotatory motion of minute pieces of camphor on the surface of pure water, which can be easily viewed without the assistance of a microscope.

Gamboge acts with much violence as a medical agent; indeed its laxative effects are such that it is now not much employed in medicine, except in certain quack preparations which are often followed by dangerous consequences. It is sometimes used, improperly, by confectioners to colour their liqueurs.

Gamboge appears to have been first known in Europe about the year 1600. The quantity at present imported into England is about seven or eight thousand pounds annually.

Natives of Australia.—These savages have a power of manipulating with their toes, so as to do many things surprising to the men who wear shoes. This power they acquire chiefly by ascending trees from their infancy, their mode of climbing depending as much on the toes as the fingers. With their toes they gather fresh-water muscles (*unio*) from the muddy bottom of rivers or lagoons; and the heaps of these shells beside their old fire-places, which are numerous along the banks, show that this shell fish is the daily food of at least the gins and children. In their attempts to steal from us, their toes were much employed. They would tread softly on any article, seize it with the toes, pass it up the back, or between the arm and side, and so conceal it in the arm-pit, or between the beard and throat.—*Mitchell's Eastern Australia.*

DRUIDICAL REMAINS.—No. III.

[Continued from No. 536.]

[Cromlech at Plas Newydd, Anglesey.]

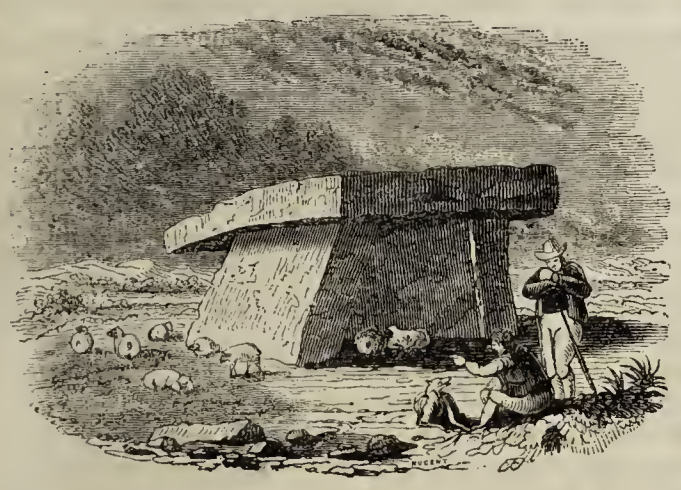
Two derivations have been given for the word Cromlech: the one, 'an inclining stone,' from the British word *crwm*, bowed, and *llech*, a broad flat stone; and the other, 'a devoted stone or altar,' from the Hebrew *Cæræm-luach;*—the first expressing the appearance of the upper and principal stone of the cromlech; the second, the horrible use to which there is great reason to believe it was put. This 'broad flat stone' is generally supported on three smaller ones, that number being chosen, according to the ingenious idea of Borlase, on account of the much greater ease of fixing the incumbent stone securely, which would find its own level on the irregular surfaces of three stones; but which, were there four or more, would require to have its under surface accurately planed, in order that it might rest equally on its supporters, whilst these too must necessarily have been of precisely the same height. In strict accordance with this idea, we find the covering stone always more or less shelving. Borlase and other writers have contended that the cromlechs were sepulchral monuments, but in answer to this it has been pointed out —1st, that in many cromlechs which have been examined, no human remains have been found; 2nd, that they are sometimes reared on the unbroken rock; and 3rd, Sir Richard Hoare mentions that on a field in the road from Newport to Fishguard there are placed within a circle of stones five kist-vaens also in a circle and enclosing a single cromlech; bones, charcoal, &c. have been found beneath the kist-vaens, but nothing of the kind under the cromlech. The other hypothesis is, that they were altars on which the priests offered their dreadful sacrifices. On this subject Cæsar has the following remarks:—"The whole nation of the Gauls is much addicted to religious observances, and on that account, those who are attacked by any of the more serious diseases, and those who are involved in the danger of warfare, either offer human sacrifices or make a vow that they will offer them, and they employ the Druids to officiate at these sacrifices; for they consider that the favour of the immortal gods cannot be conciliated, unless the life of one man be offered up for that of another: they have also sacrifices of the same kind appointed on behalf of the state." To which we may add, that Tacitus, in his account of the Roman attack on Mona, or the isle of Anglesey, the then great stronghold of the British Druids, states that "they held it right to smear their altars with the blood of their captives, and to consult the will of the gods by the quivering of human flesh." It is a striking corroboration of the theory that the cromlechs were the altars on which these dreadful sacrifices were performed, to find that in this very isle of Anglesey are yet existing, among many others, the two largest and most magnificent cromlechs our country possesses. They are both at Plas Newydd; an engraving of one of them is given above.

This view of the use of the cromlech is also supported by tradition. Holinshed, in speaking of some places "compassed about with great stones, round like a ring," adds that "towards the south was one mightie stone farre greater than all the rest, pitched up in manner of an altar, whereon their priests might offer sacrifices in honour of their gods." Nor is this tradition confined to our own country. In Mallett's 'Northern Antiquities' we find the following passage:—"Although we want the greater part of the monuments which might instruct us in that primitive stage of their religion, the traces of it are not entirely destroyed. We find at this day, here and there, in Denmark, Sweden, and Norway, in the middle of a plain, or upon some little hill, altars, around which they assembled to offer sacrifices and to assist at other religious ceremonies. The greater part of these altars are raised upon a little hill, either natural or artificial. Three long pieces of rock, set upright, serve as a basis for a great flat stone, which forms the table of the altar. There is commonly a cavity under the altar, which might be intended to receive the blood of the victims, and they never fail to find stones suitable for striking fire scattered around it, for no other fire but such as was struck forth with a flint was suitable for so holy a purpose. Sometimes these rural altars were constructed in a more magnificent manner; a double range of enormous stones surrounded the altar and the little hill on which it was erected. In Zealand we see one of this kind." In the north of Europe to this day cromlechs are known by the name of blod, *i.e.* blood stones; and in the county of Louth in Ireland is a cromlech called the Killing-stone, the hill on which it stands being also known as the Killing-hill; the name, though of course comparatively modern, may be reasonably supposed to mark an older tradition. Lastly, we may observe that existing customs bear strongly upon this point. Mr. Downes*, speaking of an

* 'Letters from Mecklenburgh and Holstein,' p. 102.

immense cromlech at Albersdorf on the confines of Holstein, says that a well informed man told him "that the cromlech was an altar for sacrifice; and that there was another in the village of Bedel, near the river Elbe, surrounded with oaks in a garden; and that it was customary to offer sacrifices upon these cromlechs before a person began ploughing, and before he was married; that no one entered this grove without making a present; and that no one swept the cave (under the cromlech) without finding money." It is a remarkable fact that a human sacrifice took place in Britain so late as 893. Einar, Thane or Earl of Caithness, made Haldanas, prince of Norway, prisoner. With horrible solemnity a sacrifice was prepared, and the victim offered up to Odin: a tumulus was erected on the spot to perpetuate the memory of the event.

The kist-vaen has often been confounded with the cromleeh, nor does it seem easy to point out the differences with precision; the chief distinction appears to be this:—that whilst the cromlech is merely a large flat stone supported by three or more smaller ones, the kist-vaen (consisting generally of three stones beneath and one above) forms a regular square-shaped cell, or, as its name expresses, stone-chest, open only on one side as if for a door. One of the most perfect specimens existing is that called Kit's Cotty House, in Kent, of which we present an



[Kit's Cotty House.]

engraving. Kist-vaens are commonly found in the middle of stone circles, sometimes with and sometimes without a cromlech standing near. They are also occasionally found isolated, and there are instances of circles being formed by kist-vaens, with and without a cromlech in the centre, but we believe there is no instance known of a kist-vaen standing within a circle of cromlechs. There are two other modes in which kist-vaens are found disposed:—one where cromlechs and kist-vaens together form a circle; and the other where the circle consists of kist-vaens and upright stones disposed alternately. A remarkable example of this last arrangement is found in the Druidical circle of Jersey, of which an engraving was given at page 308.

Like the cromlech, the kist-vaen has been supposed to have been intended for the purposes of sacrifice or of sepulture, whilst other writers suppose that both these monuments were merely greater and lesser altars, the cromlech probably for the more awful portion of the ceremonies—the sacrifices, the kist-vaens for oblations. "We were," observes the editor of the 'Pictorial Palestine,' "for a time inclined to this opinion, but on careful deliberation, and considering that the first tabernacles and constructed temples are to be taken as commentaries on the stone-monuments of more ancient date, we felt more disposed to find an analogy between the kist-vaen, or stone-chest, and the ark, or sacred chest, which we find as the most holy object in the tabernacle and temple of the Hebrews, as well as in the Egyptian and some other heathen temples."* Davies, and, more recently and powerfully, the Rev. G. S. Faber, in his great work 'On the Origin of Pagan Idolatry,' contend that this form of the ark or chest, so prevalent in all the ancient religions of the world, commemorated the ark of Noah, which formed as it were the womb or cradle of the postdiluvian races of mankind, and which, as such, was exceedingly liable to become an object of symbolization, and of type and figure. Thus, from the writings of the ancient bards, of whom we have before spoken, we gather many mystical allusions to a chest (or, as some even have it, a *stone*-chest) or ark, in which those about to be initiated in the mysteries of Druidism underwent confinement, and a severe probationary penance; it also appears that the confinement was designed to shadow out a confinement in a ship floating upon the water. A curious corroborative evidence of this last idea appears to be furnished by the springs of water sometimes found under the kist-vaen. One of the most striking passages of the nature just alluded to, is that adduced by Davies; in which Taliesin describes his probation: "I was first modelled in the form of a pure man in the hall of Ceridwin, who subjected me to penance. Though small within my ark, and modest in my deportment, I was great. A sanctuary carried me above the surface of the earth. Whilst I was enclosed within its ribs, the sweet Awen rendered me complete," &c. The kist-vaen is, then, very probably the ark here referred to; certainly there is no other Druidical remain at all adapted for the purposes described. We must not conclude this paper without noticing that the kist-vaen, like the other Druidical monuments, is found in different and remote parts of the world. Captains Irby and Mangles thus describe some specimens they found in Palestine: "On the banks of the Jordan, at the foot of the mountain, we observed some very singular, interesting, and certainly very ancient tombs composed of great rough stones, resembling what is called Kit's Cotty House in Kent. They are built of two long side stones, with one at each end, and a small door in front, mostly facing the north: this door was of stone. All were of rough stones, apparently not hewn, but found in flat fragments, many of which are seen about the spot in huge flakes. Over the whole was laid an immense flat piece, projecting both at the sides and ends. *What rendered these tombs the more remarkable was*, that *the interior was not long enough for a body, being only five feet.* This is occasioned by both the front and back stones being considerably within the ends of the side ones. There are about twenty-seven of these tombs, very irregularly situated." The passage we have marked in Italics proves, we should think, very decisively that the structures were not tombs. We shall conclude this subject in our next.

* 'History of Palestine,' book 3, chap. iv., p. 432.

SKETCHES OF THE COASTS FROM SINCAPORE TO PEKIN.

VI.—COMMERCE OF THE CHINESE.

[Continued from No. 536.]

It may not here be amiss to say a few words concerning the commerce carried on by the Chinese in their own junks. This commerce appears gradually to have contracted its sphere. Indeed if we may believe their own relations, their empire, too, has considerably fallen away, for in good old times, say the historians, it extended as far as the Cape of Good Hope. Doubtless, then, their commerce reached far beyond. But be this as it may, certain it is that whilst the Portuguese were gliding into India, the Chinese junks traded at Cochin and Cananor. It is rare, however, now to see a Chinese prow project itself beyond Acheen, and their regular commerce is only between those islands which are thought either to have been torn from the main land or to be the first indications of a rising continent,—we mean the islands of Japan, the Philippines, the Moluccas, &c. Of all these, next to Batavia, Japan is the place most frequented by the Chinese merchants, who formerly indeed carried on

a prodigious commerce with this empire. In process of time, however, the Japanese, taking umbrage at the immense concourse of foreigners, confined them to a certain quarter near the Dutch island, where they were subjected to many vexatious regulations, now partially relaxed. They are allowed to have three annual sales; one in spring, when they are permitted to unload twenty junks, a second of thirty junks, and a third, in the autumn, of twenty. If any arrive besides these, they are sent back. They commonly set sail in the month of June or July, at the latest. They commonly go first with Chinese commodities to Camboja, Siam, or Tonquin, where they load cargoes, such as ox, buffalo, and deer hides, silk, &c., for which there is likely to be a demand in the Japanese market. One article of commerce may appear extraordinary, considering the well-known antipathy of this people to pork, which is, that a number of swine are annually brought from China, but they are only sold in retail to the Chinese merchants, who are passionately fond of this meat, during their stay.

Formerly the Chinese carried on a great trade to Ternate, but the Portuguese first, and afterwards the Dutch, spoiled their traffic in that quarter. The latter now never suffer them to advance beyond Macassar. Indeed the Chinese are the only people who are allowed to trade at all to this vast island, whose inhabitants in return send great quantities of fish to the ports of the Celestial Empire. They entertain great fishing fleets of more than a hundred sail all round their coasts, and go out with one monsoon and return with another. The crews of these ships are from sixteen to twenty, and the burden from twelve to twenty tons. The suallo or sea-slug speared by them is sold, when black and very superior, to the Chinese for forty dollars each, whereas the white bring only from four to five.

The Sooloos sometimes carry the Chinese commodities to Ternate, and bring back rice, suallos, shark-fins, tortoise-shells, some small pearls, and abundance of loeri parrots. But the Dutch are too jealous to allow any of the more precious products of the Spice Islands to pass through any other hands than their own. If any is smuggled, it is in exceedingly small quantities.

The Chinese traffic also (but only by sufferance of the Dutch, from whom they are compelled to obtain passes) with the Papuans and inhabitants of New Guinea, to whom they carry iron tools, chopping-knives and axes, beads, plates, basins, &c. The return cargoes consist of misory bark, procured eastward of Dory, at a place called Warmasine or Warapine, and is sold for thirty dollars a pecul at Java, where the natives reduce it to powder to rub their bodies with. To the same use the natives apply a decoction of sandal-wood brought from the Timor and Sooloo Islands. The Papuans trade also in slaves, ambergris, suallos, tortoise-shell, small pearls, black loeries, large red loeries, birds of paradise, and many species of dead birds dried in a peculiar manner. The birds of paradise are either shot with arrows or caught with lime or nooses. When entrapped, they defend themselves vigorously with their bills, but are instantly killed, drawn, and the breast-bone taken out. After this they are dried with smoke and sulphur, and sold to foreign merchants for mere trifles, such as spike-nails or bits of old iron. From the Molucca Islands, too, is exported a delicate species of bird caught in great numbers by the natives with limed twigs. These birds live in trees (*Erythrina corallodendron*) which wave their elegant coral-coloured spikes of flowers all round the shores of these islands over the sea.

Borneo also is visited by the Chinese junks. In one part of this island the principal medium of exchange or currency consists of great lumps of bees'-wax, some thirty-four pounds in weight, or else the few pearls which are there found. These the natives barter with the Chinese for various commodities. They also export camphor, diamonds (inferior to those of Golconda), gold, drugs, pepper, cassia, gum, several sorts of dyes, edible birds' nests, and shark-fins.

Manilla, the capital of the Philippine Islands, has been sometimes visited by four hundred Chinese junks yearly, bringing silks, satins, flowered and embroidered works, carpets, cushions, morning gowns, silk stockings, tea, porcelain, varnished works, drugs, &c. They also carry great flat cakes of oranges of a delicate taste, much valued in Mexico, whither they are transported by the Acapulco galleons as a great dainty. The lading of this galleon generally consists of muslins, painted cloths, coarse cotton shirts, raw silks, goldsmiths' work, made at Canton or at Manilla by Chinese workmen, spices, and aromatics. Quicksilver likewise was attempted to be made an article of commerce with Mexico through the medium of Manilla in 1782; but the quicksilver, besides being very dear and rare, was discovered to be of an inferior quality and mixed with lead. The scheme accordingly failed for the moment. The Chinese bring back from Manilla, as well as from the Celebes, Sooloos, and Molucca Islands, edible nests, mother-of-pearl, tortoise-shells, and bêche de mer. In the Sooloo Islands the swallows, whose nests are so much coveted in China, build in caves open below to the sea, and above by a small inaccessible aperture to the open air. They are procured by divers, who plunge into the entrance and rise within the vast caverns. There they cut away as many nests as they can carry, and return the way they came.

Another quarter to which the Chinese trade is westward to Tonquin, Cochin-China, Siam, and the Malay countries. To the latter, but especially to Patane, they carry porcelain, wrought-iron, dried and salt meat, fish, &c. For the latter article they are famous, their dried and salt provisions being reckoned the best in the world. They even contrive, by covering them with a coating of clay impregnated with salt, to preserve eggs, which are deemed so wholesome, that sick persons are allowed to eat them.

To Siam the Chinese carry their wines and all the commodities mentioned above. Corals too, made of many loose teeth bound together with brass wire, are enumerated among their articles of commerce. It may also be mentioned as a trait of manners, that immodest paintings and statues in porcelain are publicly traded in by the Chinese at Siam.

From Patane they take back divers kinds of wood, cords made of the fibre of the palm-tree (which they use for rigging, and to bind together the beams of their roofs), rice, cocoa-nut oil, fruit, and buffalo, bullock, goat, deer, rabbit, and hare skins, which the peasants dry against their coming, and bring into the town in the proper season. Along the rocks also are found numbers of the edible birds' nest so prized in China. From Sumatra also the Chinese fetch ivory and bees'-wax; and from the Malay countries generally, timber, barks, scented woods, tin, Malayan camphor, pepper, opium, and a few European commodities.

The list of exports afforded by Siam is very rich. Among other things, pepper, gamboge, cardamums, perfumed wood, fancy wood, dye-wood (among others, log-wood, like that cut in Campeachy), hides, horns, bones for manure, ivory, feathers, &c. The paws also of the brown and black bear, much esteemed in China, are brought salted from Siam and Camboja, as well as from Tartary.

Camboja, Cochin-China, and Tonquin afford all these articles except pepper, and, besides them, cinnamon, betel-nuts, varnish, and dye stuffs; in return for which, among other things, the merchants of Fo-kien carry great quantities of musk.

From this outline of Chinese commerce it will appear that, in spite of the awkward build of their craft, they are by no means contemptible merchants. In fact, with

so extensive a coast, such a profusion of harbours, and so many rich commodities as this country abounds with, it would be very surprising if this were not the case. The principal impediments to commerce are two: first, the typhoons, which prevail at the equinox; second, the corsairs, who ever and anon infest the seas. "There have been pirates," says Yung-lun-yuen, in his 'History of the Chinese Pirates,' "from the oldest times on the eastern sea of Canton; they arose and disappeared alternately, but never were they so formidable as in the years of Kea-King, at which time, being closely united together, it was indeed very difficult to destroy them." In spite of the boasted police regulations of the empire, pirates often rendered the passage from Hongsham to Canton excessively dangerous; and it was only by underhand influence that the sea robbers alluded to by Yung-lun-yuen, and who flourished in the beginning of this century, could be subdued. The exploits of Koshinga are remembered by all, and the Europeans have not been without a share in these piracies, for the Dutch often extended their incursions into the very bay of Canton, with the professed purpose indeed of annoying the Portuguese, though, doubtless, little caring what booty they obtained, so as no evil consequences were threatened to themselves.

[To be continued.]

THE USES AND THE MANUFACTURE OF A SHIP'S ANCHOR.—No. I.

Among the peculiarities which distinguish a floating body from one that moves on land is the difficulty of staying the progress when motion is no longer desirable: however valuable winds and currents may be as sources of motion, yet the very facility which they present for that purpose renders it difficult to stop a floating body, such as a ship, when under the influence of either. In fact, no plan has hitherto been devised but that which may, in familiar terms, be called hooking the floating body to the solid bed beneath the water; for an anchor may be deemed a hook, caught or entangled in the solid bed beneath the ocean, and connected with the ship by a rope.

The early substitutes for an anchor seem to have been large stones, baskets full of stones, logs of wood loaded with lead, sacks filled with sand, and other rude and heavy contrivances. The anchors of the ancient Greeks are said to have consisted usually of large stones, which did not, like modern anchors, penetrate into the soil beneath the sea and so cling there, but merely retained the vessel by their inertia and by their friction along the bottom. The notable improvement was when iron flukes, spikes, or teeth were so fixed to the heavy body as to be able to penetrate into the ground, and thus take firm hold: this improvement is attributed by some to Midas, king of Phrygia; and by others to the Tuscans. These iron anchors had at first only one fluke or tooth, but afterwards they had two; and there appears to have been no very great difference between the anchors of the time of Pliny and Strabo, and those of our own day, in outward appearance, except in the absence, in former times, of that part which is called the stock.

In our own day, boats and other small vessels employ what are called grapnels, consisting of a series of five or six hooks arranged round in a circle, so that one or other of them is almost certain to cling to the ground or to any other body when thrown upon it. In the East Indies a sort of anchor is employed called the mushroom anchor, from its great resemblance in shape to that plant: it is a hollow cup, the edge of which digs into the ground and clings to it sufficiently firm to maintain a hold. Anchors of a peculiar kind have sometimes been used under the name of floating anchors. These are intended to stay the beating about of a vessel in some degree at spots where the sea is too deep to be fathomed by the cable to which a regular anchor is attached. One suggestion for this purpose was a stem of wood, twenty-five feet long and four inches square, with four boards, eighteen, sixteen, fourteen, and twelve feet long respectively, and one foot in width, with a hole in the middle of each about four inches square, so that it might occasionally be slipped upon the stem at right angles with it. This was proposed to be thrown into the sea, and retained at a certain distance by a rope, in such a position that the resistance offered by its service might in some degree control the movement of the vessel. Another suggestion was as follows:—Two long iron bars are riveted together at the centre, and ropes stretched tightly from end to end of the bars, so as to form a square frame-work. Over this frame is stretched a doubled or quadrupled sailcloth, well secured to the ropes. In each bar are two holes, at equal distances from the centre; and to these holes the ends of two pieces of rope are fastened, the other ends of which are connected to a rope kept on board. The machine thus forms a sort of large water-kite, and is thrown into the water, where it is prevented from sinking to a greater depth than twelve fathoms by a rope which connects it with a buoy floating on the sea. The large surface which the machine exposes to the sea was expected to be serviceable in retarding or steadying the motion of the vessel. Numerous other contrivances, having the same object in view, have been from time to time proposed, but none have been found to answer the desired purpose; and we believe that no such thing as a floating anchor is used in the royal navy.

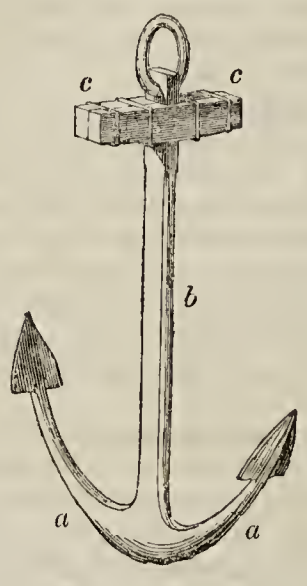
Another kind of anchor occasionally employed is that called the mooring anchor, used for securing vessels in certain situations in harbour or roadsteads. As these anchors do not require to be lifted into the ship, but are fixtures in the harbour, there is no need to adopt any particular form, provided the weight be sufficient to retain a vessel in its place. A mooring anchor often consists merely of a ponderous block of stone, with a ring fixed in the middle of the upper side; or several large stones are fastened together, so as to make one effective whole. Sometimes one of the largest anchors used for a first-rate ship, weighing eighty hundredweight, is selected, and one of the arms or flukes is beaten down close upon the shank, to prevent it from entangling the cable connecting the vessel with the anchor: this is usually done only when one of the flukes of a large anchor is damaged and unfit for use. About thirty years ago Mr. Hemman of Chatham devised an improved form of mooring anchor, made of cast-iron, and very massive. The form bore some resemblance to that of a spade; and when the edge had once penetrated the ground beneath the water, it was calculated to take a very firm hold.

But the anchors most important of all are those which a ship carries on board, and which are used as occasion requires to stop the progress of a vessel. Ships of the first class carry seven anchors; and the smallest class, such as brigs, cutters, and schooners, usually have three, varying in size according to the class of vessel. Different names are given to the anchors of a large ship: the sheet anchor is the largest of all, and is stowed away in the fore part of the vessel, on the side called by seamen the larboard; it is only used in cases of great necessity, or when the ship is beset by heavy gales: the bower anchors are either two or three in number, the largest being nearly equal in size to the sheet anchor; the name used to be bowyer, from the bow, the end of the ship from which the anchor is suspended: the stream anchor is much smaller than the bowers, generally not above one-fourth or one-fifth of the weight; it is used principally in streams and rivers of moderate force: the kedge anchor is the smallest of all, being only half the weight of the stream-anchor; it is used principally to assist in what is called kedging a ship, that is, to bring a ship up or down a narrow river by means of the tide, though the wind be contrary.

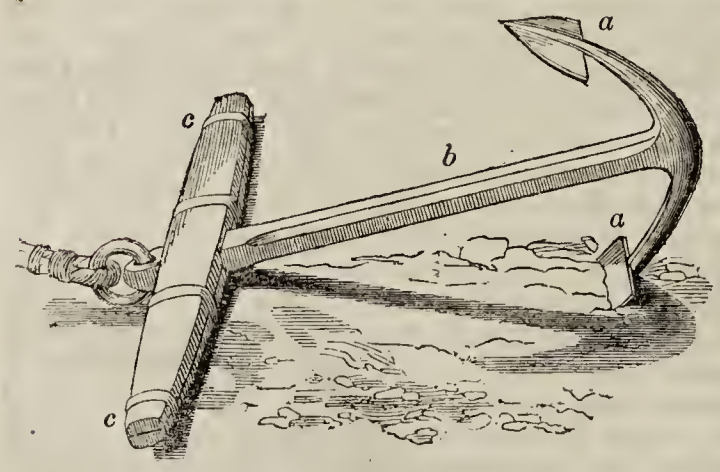
The largest anchor in a first-rate man-of-war weighs

as much as ninety hundredweight; in an eighty-gun ship, seventy-six hundredweight; in a seventy-four-gun ship, sixty-eight hundredweight; and so on down to the smaller vessels. The cost for labour in the manufacture of anchors varies from twenty-four to sixty shillings per hundredweight, according to the size of the anchor, the largest sizes being more expensive in proportion: the total expense of one of the largest anchors is about 300*l*.

In order to understand the mode in which the fluke of an anchor is made to cling to the ground when cast into the sea, it will be necessary to speak of its general form. The first cut represents an anchor in its vertical position and the second its position when one of the flukes has penetrated the soil beneath the sea. The hooked arms (*a*, *a*) are terminated at the ends by tolerably sharp points,



calculated to penetrate into the ground; and when one of these arms has taken fast hold, the motion of the vessel tends rather to increase that hold than to diminish it, on account of the concave form which the arm presents: the vessel can then only move by one of three things happening—the fracture of the arm from the other part of the anchor; the fracture of the cable connecting the anchor with the ship; or the ploughing up of the soil by the arms immersed in it, and the consequent liberation of the anchor. The extremity of each arm is increased in width, and forms the blade, on which is fixed a broad, flat, triangular plate, called the palm: the use of this palm is, by exposing a broad surface, to take a firmer hold of the ground. The peak, or bill, is the sharp extremity which first penetrates into the ground. Sometimes each arm is curved, as we have stated; but in other instances it is quite straight, the two arms making a definite angle with the shank or upright portion. This shank (*b*) is a



strong iron bar, or assemblage of bars, connecting the arms with the stock (*c*, *c*), a powerful wooden cross-piece, at right angles to the direction of the arms: the lengths of the stock and of the shank contribute to make one of the arms penetrate the earth. A ring at the upper end of the shank serves for the attachment of the anchor to the great cable by which it is held.

Were it not for the cross-piece called the stock, it would be difficult to ensure the catching of either of the arms in the ground; but they enable that effect to be almost always ensured in the following manner:—the anchor, when on board, is placed in a situation convenient for dropping into the sea. To the ring is attached one end of a cable, which is either a stout rope or an iron chain; and this cable is arranged along the deck in long coils, perfectly free from all confusion or entanglement, the remote end of the cable being firmly attached to a proper place on deck. Nautical phraseology and technical terms are so little understood by landsmen, that we must not attempt to detail the manœuvres by which the anchor is freed from its fastenings; we will therefore merely say, that when it is let go, it falls into the sea, descends rapidly, and draws the cable after it so violently, that it is often necessary to throw water on the woodwork against which the cable rubs, to prevent it from taking fire. The anchor pitches violently on the ground with the arms downwards, and neither peak in such a position as to enter the ground; but it presently falls over, and in so doing, the position of the stock at right angles to the arms, and its length and height, together with the weight of the cable, are sure to throw it with one of the arms pointed into the ground. Where the ground is known to be so soft that the anchor will not take firm hold, it is a plan sometimes adopted to cover the arms with a broad triangular piece of plank, much larger than the arm itself. The more horizontal the cable is which connects the anchor with the ship, the less likely is the arm of the anchor to be dragged from its hold.

The weighing of an anchor, or the drawing it up from the anchoring ground into the ship, is an operation requiring the joint exertions of a great number of men. A sort of windlass, on a very enormous scale, called a capstan, is erected in a particular part of every ship, and round this windlass the cable holding the anchor is wound; or, if the cable be of too great diameter, a smaller rope, wound round the windlass, draws in the cable. The capstan has a number of holes arranged round its circumference, and into these holes the seamen insert long bars, which then appear like radii, or spokes of a wheel; the bars act as levers, and by their aid the men are enabled to turn the capstan. The vessel is gradually drawn nearly vertically over the anchor, which is thus raised on end, and liberated from its hold on the ground without difficulty; the anchor is then weighed, and stowed away in its proper place.

An anchor of the largest size is a ponderous mass, although apparently trifling when seen in its place on board. An anchor of ninety-four hundredweight is of the following dimensions:—length of the shank about nineteen feet; and of the square end to which the stock and the ring are attached, above three feet: the thickness of the shank varies from eight to twelve inches, each arm is more than six feet in length, and the triangular palm at the end of it measures three feet in each direction: the ring to which the cable is attached is three feet in diameter, and made of iron five inches in thickness; the stock or cross-piece is about the length of the shank.

In a second paper on this subject we shall attempt to convey an idea of the manner in which the mass of metal constituting an anchor is put together, an operation concerning which some spirited lines will be found in 'Penny Magazine' (vol. v., p. 39). We may here remark, that since the conclusion of the war many improvements have been suggested, and partially introduced, in the construction of anchors, particularly by Lieut. Rodgers; but it will be sufficient to give a general view of the subject if we describe the common mode of making anchors such as were used in the royal navy throughout the war.

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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MANUFACTURE OF SALT IN SCOTLAND.

[A Salt-Pan on the Forth.]

A GENERAL description of the different modes of obtaining salt, practised in various parts of the world, having been already given in our pages,* we propose to devote the present article to a short but more particular notice of the process of obtaining that useful article from salt-water by evaporation produced through the agency of artificial heat. In Scotland this method has been pursued from a very remote period, and to an extent probably unequalled in any other country. Records are still in existence attesting the endowment of abbeys with salt-pans, some of them referring to a period as early as the twelfth century: the abbey of Holyrood, for instance, was endowed by David I. with the salt-pan of Airth, near the head of the Frith of Forth, along the shores of which noble river the chief salt-pans are still found. The mode of manufacture is said to have been greatly improved during the reign of Mary, Queen of Scotland, by the attendants whom Mary brought with her from France, and who received in consequence an exclusive privilege for the production of the commodity, which was continued until the reign of Charles II. At two different periods the Scottish salt manufacture has received great injury; the first, at the time of the Union, when the duties levied in both countries were equalised (the ruins of salt-pans scattered along the whole coast of Fife yet attest the effects of that measure); and the second, when the duties were entirely repealed, a few years ago, in consequence of which many important works were relinquished. We have now to describe the mode of manufacture.

Near the shore, in a suitable spot, is erected a long and low building, divided into two parts—the one called the fire-house, intended to shelter the workmen and to contain the fuel required; the other, known as the boiling-house, fitted for the reception of the pan in which the brine is contained during evaporation, and for the furnace below. The pan is of an oblong form, commonly measuring about fifteen feet in length, twelve in breadth, and in depth about fifteen inches. The material is generally wrought-iron, but the sides are sometimes of lead, as the iron is apt to oxidize. A walk five or six feet in breadth extends on each side of the pan for the accommodation of the workmen who assist in the operations. The roof of the saltern (as the building is called), which is partly open to allow of the escape of the steam, is fastened with pegs of wood, as iron nails would quickly be destroyed by the vapour. Near to the saltern is a shed containing the cistern, which is fixed at such a height as to allow the salt-water it holds to run through pipes into the pan. The cistern is filled by means of machinery, which pumps up the sea-water from a well communicating by long pipes with a pool or 'lump' in the shore. It is an object with the workmen to draw the water from a point as far below the surface as possible, as they then find it more impregnated with salt, and therefore requiring less trouble, and involving less expense for firing in the process of evaporation. When the sea-water in the cistern has had sufficient time to settle, and deposit its mud and sand, it is allowed to flow into the pan (or pans, for there is generally in the large works a range of them extending on both sides of the cistern), and a strong fire is now lighted in the furnace beneath. As soon as the fluid is lukewarm, it is

* Vol. iv., p. 66.

clarified, either by mixing the white of three or four eggs with two or three gallons of water, and pouring the mixture into the pan, or by means of the blood of sheep or oxen. As the water gets still more heated and approaches to boiling, a frothy scum appears, which is collected into little vessels fixed one at each corner of the pan: after this process, the water speedily becomes clear. Having boiled about four hours, crystals appear on the surface, and the amount of water is seen to be greatly lessened: the pan is now refilled with fresh sea-water, allowed to heat, clarified, and cleared from the scum as before, the whole of the process being exactly repeated, and the same a third and a fourth time: after this the pan is no longer supplied with fresh water, the fire is slackened, and, at the end of ten or twelve hours, a large quantity of salt is found nearly dry at the bottom of the pan. This is now raked together into one or two heaps, in order that the brine may drain off; next it is conveyed in barrows to the store-rooms, and laid in 'drabs,' or wooden troughs with shelving bottoms, to allow what little moisture remains to drain away, and from which it is taken, in three or four days' time, perfectly fitted for immediate use. Each pan of salt requires in the making about twenty-four hours in the whole, so that only five pans a week can be made. The furnaces, however, are never permitted to cool: when the workmen are about to leave on the Saturday afternoon, they place a small quantity of brine in the pan, which is left to simmer, without attendance, till Monday morning; and the product is the Sunday salt, which is in such great request in some parts of Scotland, as being much finer than the ordinary 'every-day' salt. The fuel used is small coal, which, by a curious incongruity, is called wood: the origin of this custom may in all probability be traced to a period when wood alone was used. Two men attend each salt-pan, one of whom is a sort of drudge to the other. These people are a very peculiar race. In appearance and manners they are not unlike colliers, whom too they resemble in another point, their former state of slavery. Till within the last fifty years or so, the salters were transferred with the works on any change of property, in as positive a manner as the black population in our own colonies prior to the late changes, or as the American slaves at this moment. Their freedom was obtained by an application of the proprietors themselves, a rare and honourable action; but so little did the salters themselves appreciate it, that they exclaimed against the whole affair as nothing more than a petty attempt on the part of the proprietors to relieve themselves of a trifling burden to which they were liable on the marriage of a salter or coalman! We conclude with observing that a great proportion of the salt thus prepared is carried by women, chiefly the wives and other relatives of the salters, to Edinburgh.

USES AND MANUFACTURE OF SHIPS' ANCHORS.—No. II.

In the former article on the subject of the anchor we endeavoured to give an idea of the different forms given to the instrument, and of the mode in which it is used at sea. We have still to give a few particulars respecting the mode of manufacture

There is perhaps no kind of smith's work more gigantic than that of anchor-making: the large masses of iron employed and the mechanical force necessary for welding the several parts together render the employment of powerful apparatus indispensable. The finest establishment for anchor-making at present is, we believe, the Royal Dockyard at Woolwich, where the bellows and the hammers are all worked by steam-power, and where various improvements in the manufacture have been introduced. But we shall find it convenient to speak of the more common modes of manufacture by manual labour.

The several parts of an anchor are made separately, and then welded together: the shank, the arms, the palms, the ring, &c., are attached to each other after they have had the necessary forms given to them. The most ponderous part of an anchor is the shank, or perpendicular bar, and as this is, in a large anchor, nineteen feet long and ten or twelve inches thick, it would be impracticable to form it out of one piece of iron; it is therefore built up of a great number of pieces welded together into one solid mass. The general form in which this is done, except when the improvements of Mr. Pering and Lieut. Rodgers are adopted, is as follows:—Four iron bars of comparatively small diameter are laid together in the form of a square; on each side of this square smaller bars are laid, perhaps ten or twelve in number, so as to give to the mass a somewhat circular form: outside these are ranged thirty or forty bars like the staves of a barrel, so as to make the mass both larger and more nearly cylindrical. Finally iron hoops are driven over the bars at certain intervals along their length, to bind them all together. The mass is then heated to a welding heat, and hammered till all the bars combine into a compound mass of iron, of which the separate pieces are not distinguishable.

But in this mode of making the shank certain serious defects are found. The mass is so thick and the separate bars are so numerous, that the effect of the hammering scarcely reaches the central bars; and moreover the outside must be heated in the fire to a destructive degree before the centre can be brought to a proper welding heat; so that in many cases the outside only is perfectly welded, the inner portions being left nearly in their original state. To remedy this defect, Mr. Pering, clerk of the cheque at Plymouth, devised a mode of making the shank of broad bars equalling the whole diameter of the shank, laid flat one on another, welded at two heatings and bound with iron hoops. Still more recently Lieut. Rodgers has devised a hollow shank, on a principle which is well understood by engineers, and which is beautifully shown in nature by the form of the bones of animals; that is, that if a given weight of material be formed into a hollow column or pillar, the column will possess more strength than if it had the same amount of material and were made solid: the greater diameter of the hollow column increases the resistance to fracture, without the weight being increased. This is only one of the numerous improvements which Lieut. Rodgers has introduced in the form of the anchor.

It may reasonably be supposed that the heat required to bring such large masses of iron to a welding* state must be very intense, and that the removal of the masses from the fire to the anvil must be done speedily to prevent loss of heat. On the ground of the anchor-smith's shop a brickwork hearth is erected six or seven feet square, and at the back of the hearth is erected a strong brick wall, faced with fire-stone at the part likely to be exposed to the fiercest heat. At some distance above the hearth is a kind of dome with a chimney in the centre through which the smoke from the fire escapes. The fire is built up on the hearth in a singular manner, the coals being ranged round so as to form a hollow oven. In the first place a layer of coals is spread evenly on the hearth; then some large cinders are ranged round in a circle, and this circle is gradually carried upwards and inclined inwards until it meets at the top. The construction of a boy's grotto with oyster-shells would not be a bad mode of illustrating this. A door or opening is left in one

* The property of welding is possessed by iron alone. It is simply this:—Two pieces of iron are heated to a certain point, so as to soften the texture; they are removed from the fire, laid on an anvil, and hammered, when, after some time, they are found to have become as perfectly united as if they originally formed one piece. The principle is much the same as that by which we are enabled to join two pieces of sealing-wax; except that in the latter case no hammering is required. It has been a disputed point whether or not platinum possesses the property of welding; but we believe it is now considered not to possess it. All other metals are united by solder.

side of the coal-made oven, into which the end of the mass of iron is introduced. As the shank is, as we have said, sometimes as much as nineteen feet in length, only so much of it is heated at once as can be hammered or welded by the men before it gets cold ; and this amount of its length is just able to be contained in the coal-oven.

When the several bars of which the shank is to be formed are ranged in their proper places and secured by hoops, the whole mass is suspended from a crane, which has such a facility of motion, that one man can turn the crane towards the forge and introduce one end of the shank into the fire. As soon as this is done, the orifice round the shank is filled up with pieces of coal, so that the iron is completely surrounded by blazing coals on every side : here it remains for a space of time varying from half an hour to an hour, according to circumstances, a fierce heat being maintained the whole time by means of immense bellows. These bellows are (except where steam-power is employed) worked by the same gang of men, eight or ten in number, who afterwards forge the iron when hot. The bellows, situated on the opposite side of the vertical wall to that where the fire-place is erected, are two in number, and resemble the common domestic bellows rather than those employed by the generality of smiths, that is, wind is forced out only at the downward pressure of the upper boards. A chain rises from the handle of these bellows, and is attached to one end of a lever in such a way as to enable two or more men, by working the lever to and fro, to set the bellows in action. While some of the men are at work at the lever in order to raise the upper board, by which air gains admission into the bellows, others are standing aloft so as to get on the upper board when it is raised, and by their weight to press it down again: one bellows is being worked upwards while the other is being pressed down, so that the men mount from one to the other alternately. This rude mode of working the bellows is scarcely worthy of the mechanical ingenuity of the present day, and it is no wonder that steam-power has been partially substituted for it. A small hole lined with iron penetrates the brick wall close to where the fire is kindled, and into this hole the nozzles of both pairs of bellows are introduced, so that the wind is impelled directly into the fire. If the coals forming the hollow oven become burnt through in any place to the external air, the fireman immediately covers the spot with new and damp coals, so as to confine the heat entirely to the central parts which immediately surround the metal.

The shank of the anchor is turned over several times while in the oven, in order to become equally heated in every part, and when thoroughly heated through to the welding temperature, it is drawn from the oven, and the crane from which it has all along been suspended is moved round so as to bring the heated part over a solid block of iron lying on the ground, which serves as an anvil. The men now arrange themselves in regular order : one man, who acts as foreman, looks on and points with a wand to the particular spot where the blows are to be directed ; one man grasps an iron bar attached to the remote end of the shank, by which he is enabled to turn it round as occasion may require ; and the other men, generally either six or eight in number, arrange themselves nearly in a circle, and with heavy hammers, weighing sixteen or eighteen pounds each, strike the red-hot iron. They all strike in succession and with the greatest regularity, and all strike on the same spot, until the foreman points to a new one. The hammers have steel faces, and are furnished with very long handles ; they are wielded over the head and shoulder at full arm's length, and fall on the iron with powerful effect. When the iron has so far lost its heat as to be incapable of further welding, several iron pins are driven in in a curious way. The foreman takes a pin (a sort of thick nail without a head) in a cleft stick, and places its point close to the iron, which, though not hot enough for welding, is still soft and yielding : a few powerful blows with the hammer drives the cold hard nail into the soft and yielding iron : the effect of this is to condense, harden, and secure the various pieces of iron together more effectually.

When the end of the shank has been thus welded to the proper form, it is again put into the oven, which is prepared to receive it, and which has now a hole broken through in the opposite side to that at which the end enters. The object of this is, that the part already welded may be thrust out beyond the reach of the fire, and another portion exposed to the action of the heat. When this portion has attained a welding heat, it is removed from the fire by the same means as before, and hammered on the anvil till it has assumed the proper form and proper degree of compactness. These successive heatings and hammerings are continued until the whole length of the shank has been thus treated ; and afterwards the shank is hammered again to make the surface smooth and even, and to fill up any little pores or apertures which may exist in the surface, and which, if left unremedied, might form lodgments for sea-water, and thus become rusted.

But powerful as is the effect of the long continued beating by six or eight heavy hammers, yet the consolidation is not so completely effected as by means of one enormous hammer or ram, called a Hercules. This nearly resembles the ram or monkey used in pile-driving, for laying a foundation for the piers of bridges, &c. The ram is a mass of iron weighing about five hundred pounds, and capable of sliding up and down in a kind of groove. A strong rope is fixed to the top of it, and to this rope are spliced the ends of six or eight others. As many men are employed as there are ropes, and they conjointly draw up the ram to a height of seven or eight feet ; then letting it go, it falls with a powerful effect on an anvil placed beneath it. This anvil is so situated that the heated end of the shank may, by turning round the crank from which it is suspended, be brought immediately upon the anvil. It is considered that the comparatively few blows given by this ram are more effective than the numerous blows given by six or eight hammers. In the government establishments where steam-power is employed, an enormous tilt-hammer, weighing several tons, is employed for this purpose.

The shank has generally a somewhat circular or octagonal form given to it ; and the two ends have to be so cut as to form scarps or grooves for receiving the other parts of the anchor. These grooves are made by cutting away some of the metal while still hot, with steel chisels, and then perfecting the shape by means of stamps or punches. All this is done with comparative ease while the iron is hot and yielding.

This description of the processes by which the shank or long shaft of the anchor is formed, will apply to most of the other parts, except that all the latter are of much smaller size. The arms are being made at another forge, and by a separate set of men, while the shank is forming. They are shaped in the various parts according to the required pattern, and generally have a curvature given to them, though in some instances they are made quite straight. A searfing or groove is made at the thicker end, to correspond with that at the lower end of the shank ; and when these two grooved ends have been heated to the proper point, they are laid together and welded on the anvil. But in some anchors the arm is not united to the lower end of the shank in this manner ; an alteration was introduced by Mr. Pering, in which the lower end of the shank is made to bend round to meet the arms, so that the transition from one to the other is a curve, and not a sharp angle, at the same time that there is no actual joint at the spot separating the shank from the arms. In Lieutenant Rodgers's anchors nearly all

the parts are formed in a manner peculiar to himself, and displaying great ingenuity.

By whatever way the arms are attached to the shank, the broad palms are fixed on separately: these palms are sometimes made of sheet-iron forged to the proper shape and thickness; or of several bars laid side by side, and forged into one piece, like the bars of which the shank is made. The enormous ring by which the anchor is suspended from its cable, is attached to the upper end of the shank, where a hole is bored, or rather punched, for its reception: this hole is made by steel punches while the iron is hot; small punches being used first, and larger ones afterwards. The ring is made of several small bars welded together, drawn out into cylindrical form, put through the eye or hole in the shank, bent into the form of a ring, and the two ends welded together. When the whole of the iron-work of the anchor is put together, it is heated to a lower temperature than before, and every part is beaten with hammers of a rather smaller size than the sledge. This hammering is continued until the metal becomes black and cold; the object being to render every part as hard and smooth at the surface as possible, in order the better to resist the rusting effect of sea-water.

The anchor is now to be provided with the stock—that cross-piece (generally formed of wood) which is attached to the upper end of the shank, a little below the ring. The common form of the stock is this:—Two beams of oak are made to embrace the upper end of the shank, and are firmly united by iron bolts and hoops; these beams are about the length of the shank, their united thickness at the middle is about one-twelfth of the length, and they taper off gradually towards the two ends. The stock is kept in its place on the shank by means of two projecting nuts or iron blocks placed above and below it. The stock has been of late years frequently made of iron: in this instance it consists of a long cylindrical bar, about half as thick as the shank of the anchor; but instead of passing round the shank, as the wooden stocks do, it passes through a hole bored in the upper end of the shank. Stocks of this kind are chiefly useful where it is desirable to take them out of their places for the convenience of stowing away the anchor on board a ship. When the stock is put through the hole in the shank, it is secured there by a kind of linch-pin, which holds it securely.

It will be easily imagined that the workshop where such labours as these are carried on, must have a formidable appearance; indeed a Devonshire tourist, speaking of the anchor-smith's shop in Devonport dockyard, as it existed a few years ago, describes it as something more than formidable. "Those who are unaccustomed to places of this kind, feel strong sensations of horror at first entering. The clanking of the chains used to blow the bellows, the dingy countenances of the workmen, the immense fires, and above all, the yellow glare thrown on everything by the flames shining through the dismal columns of smoke that continually fill the building, form altogether a very terrific picture." The improved machinery now employed is very likely to rob such a scene of many of its disagreeable features.

DRUIDICAL REMAINS.—No. IV.

[Concluded from No. 537.]

[Harold's Stones, Trelech, Monmouthshire.]

In this our concluding paper, we have to notice the cairns, or heaps of stones, and the stones erect, or rude pillars, the only classes of Druidical remains that have not hitherto engaged our attention. The cairns are frequently mentioned in Scripture, and in every instance, when not accompanied with a pillar, we find them raised with the same object, namely, to cover the remains of those who died in crime, and whose memories it was intended to dishonour. Such were the heaps of stone raised over the remains of Achar, the king of Ai, and Absalom. In Syria and Palestine it is still usual for one who passes such a heap to throw a stone on it, in order to express his detestation of the infamy commemorated, as well as to contribute to the maintenance or increase the size of the monument. In Scotland, too, in some parts, it was formerly, and perhaps still is, common for a person offended to say to the offender, "Never mind, I shall throw a stone on your cairn yet." Many of the cairns in this country have been opened, and generally found to contain undoubted evidences of human interment; and where this was not the case, their absence may be very reasonably accounted for by the supposition that the body was burned (as in the instance of Achar), and the stones heaped over the ashes.

Of the stones erect, it may be at once stated, in the words of the editor of the 'Pictorial Palestine,' that "taken generally, they were *stones of memorial*." They were the earliest records of all great or highly interesting

events—religious manifestations or covenants, important treaties or victories, the deaths of distinguished or dearly-beloved persons, the settled boundaries of estates, were all recorded in this simple, but for the time, no doubt, sufficient manner. The first historical notice bearing directly upon the subject is the Scriptural mention of stone set up by Jacob to commemorate his vision. The size of this stone was necessarily small, like perhaps those ancient stones dispersed about our own country, three or four feet high, and whose history lies too far back even for the reach of tradition. We may also mention the stone set up by Joshua under the oak of Shechem, a little before his death, when he made the Israelites once more solemnly renew their covenant with God. In the first book of Samuel, chap. vi., v. 15, 18, a stone of great magnitude is referred to, on which the ark of God rested on its return from the land of the Philistines, and which was previously well known as the great stone of Abel. The solemn treaty of peace concluded between Jacob and Laban was marked by the addition of a heap of stones to the rude pillar, a circumstance, however, that is not mentioned in the Sacred writings in such manner as to lead to the inference that any new custom was instituted. In Great Britain we have to this day similar monuments. At Boswen's Croft, Sancred, in Cornwall, is one in particular, "which answers so exactly to that which the description would suggest that Jacob and Laban had erected, that if it had been found in the country beyond Jordan, travellers would probably have concluded it to be the same."*

The custom of setting up large stones to commemorate victories, we find, from the Sacred writings, was also in use among the Hebrews. The Ebenezer, or "stone of help," set up by Samuel, is an instance of this nature. In the British Isles the custom appears to have been not only common, but to have continued down to a late period. Thus we find Malcolm, son of Kenneth, king of Scots, commemorating his victory over the Danes in this mode in 1008. Near Newbridge, in the county of Cork, Ireland, are three large stones set edgeways towards each other, which are said by an uncontrovertible tradition to refer to a battle fought on the spot between Brian Boiruma, king of Munster, and the O'Mahonies of Carbery, assisted by the Danes, most of whom were slain. To this origin doubtless may be referred many, if not all, of the large stones isolated from Druidical remains, and dispersed in different parts of the country. We may particularise the three stones called Harold's Stones (represented in the engraving at the head of this article), which stand in a field at Treleeh in Monmouthshire, the highest of which is about fourteen feet; and the similar stones, called the Devil's Arrows, near Boroughbridge, which are, however, larger and wider apart than the three stones known as the Devil's Quoits, which formerly stood near Stanton Harcourt in Oxfordshire. The history of all these is unknown: we may add that it is a curious circumstance to find the number and general arrangement of these stones should be the same in so many instances.

With regard to sepulchral stones, we may observe that it was not usual with the Hebrews to bury their dead in isolated places where a memorial stone would be needed, large excavated family sepulchres being general; but when cases occurred that it became necessary to inter distinguished persons at a distance from the resting-places of their fathers, the rude pillar was then set up to mark the place. It was under circumstances of this nature that Jacob set up a stone over his beloved Rachel. Among some of the nations of antiquity the custom was very general: the Greeks, for instance, had for ages no other funeral monuments than a rough unhewn stone set upon the top of a tumulus. In the 'Iliad' we find Paris, whilst in the act of using his bow against the enemy, bending behind the pillar placed on the tumulus that contained the ashes of Ilus, the son of Dardanus, the ancient king of Troy. Minutely corresponding with this monument is the one at Castle More, near Tullagh in Ireland. It consists of a tumulus thirty feet in perpendicular height, with a square stone on the top about five feet in height: on one side are appearances of an entrance into a cave beneath. We have one positive and interesting case on record of the erection of a vast monument of this kind. Harold, the son of Gormon, employed his whole army and a vast number of oxen to draw a stone of enormous size from the shores of Jutland to be placed over the grave of his mother.* We may observe that our own churchyards to this day present but a modification of the usages we have described: in the mound and headstone we still see the tumulus and pillar of ancient times.

The following engraving represents an existing monument of the period when the rude sepulchral and other pillars we have described began to give place to works of a more strictly architectural character. These pillars are situated near Tartous and the Isle of Aradus in Syria, and are supposed to have been built by the Phœnicians.

The use of stones erect for marking boundaries must be

* 'History of Palestine,' b. iii., p. 358.

* Wormii, 'Mon. Dan.,' p. 39.

[Monumental Pillars near Tartous in Syria.]

very ancient; perhaps, indeed, this was one of the earliest purposes to which such rude monuments were applied. Every one will remember the fearful denunciation in the book of Deuteronomy, "Cursed be he that removeth his neighbour's land-mark:" another interesting notice of this custom is given in the 'Iliad,' where Homer, speaking of the great stone thrown by Minerva at Mars, says, as King renders the passage,* that "she, retreating, seized in her strong hand a stone lying in the field—black, rough, and vast—which men in former times had placed as a boundary of cultivated land." How long and how effectually this custom existed, Olaus Magnaus, archbishop of Upsall and metropolitan of Sweden, speaking of his own parts, about the middle of the seventeenth century, bears testimony with justifiable pride: "There are also high stones, by the aspect and signature whereof the ancient possessions of provinces, governments, forts, communities of noble and country men, are suffered to continue to every man in peace, without laws, suits, or arbitration, giving an example to other nations, that among these nations there is more right to be found in these stones that are boundaries, than elsewhere in the large volumes of laws, where men think themselves to be more learned and civil."†

A monument frequently associated with cromlechs in the centre of the Druidical circle is a large block or upright stone, which Toland supposes was the pedestal of an idol, and other antiquarians agree in the hypothesis. According to Al Jannabius, many of the ancient gods of the Arabians were no other than large rude stones, the worship of which the posterity of Ishmael had first introduced. "To us it seems most probable that these great stones were the first places of divine worship among the Arabs, on which they poured wine and oil, as Jacob did upon the stones that served him for a pillow when he saw his vision. Afterwards they might worship these stones themselves, as the Phœnicians in all probability did."‡ Whatever might have been the religious uses of these stones in our country, their civil was, it appears, to mark the station of the chief person in any important public assemblage, and was chiefly used for inaugurations. In some cases the stones are such as the person to be inaugurated might stand or sit upon; in others the form shows that they were intended merely to mark the spot at which he was to stand or sit. In the Western Islands, where, from their sequestered situation, old customs existed longer than in England, remains of the crowning or inauguration stone are still found. In the Isle of Isla there was fixed a large stone seven feet square, in which was a cavity, or deep impression, to receive the feet. In this cavity Macdonald stood when he was crowned King of the Isles, and thus standing, swore to continue all his vassals in the possession of their lands, and to render exact justice to all his subjects, &c. Stones thus bearing the impress of feet are found in different parts of the world, and the use of erected stones for the purposes of inauguration is frequently mentioned in Scripture. A very interesting remain of this description is preserved under the chair in which our sovereigns are crowned. "This is supposed to be the same stone on which the supreme kings of Ireland were to be inaugurated in the times of heathenism on the hill of Tarah. It was a persuasion of the ancient Irish, that one of their blood should reign in whatever country this stone remained. Hence it was sent to confirm the Irish colony in the north of Britain, where it always continued to form the coronation chair of the Scottish kings, until it was removed by our Edward I. from Scone, and placed under the coronation chair in Westminster Abbey, where it has ever since remained, being, as Toland observes, 'the ancientest respected monument in the world; for although some others may be more ancient as to duration, yet thus superstitiously regarded are they not.'"*

* 'Munimenta Antiqua.'

† 'A Compendious History of the Goths, Swedes, Vandals, and other Northern Nations,' 1658.

‡ 'Ancient Univ. History,' xviii., 387.

SKETCHES OF THE COASTS FROM SINCAPORE TO PEKIN.

VII.—The Island of Formosa.

[Continued from No. 537.]

We have already more than once alluded to the circumstance of the province of Fo-kien being overpeopled, and the necessity it is under of continually sending forth emigrants to various quarters of the Indian Archipelago. One of the principal places to which this tide of population flows is the beautiful island of Formosa, where nature seems to have combined almost everything calculated to tempt and to reward immigration. The passage of the Chinese thither is, however, impeded as well by the high seas which constantly prevail in the channel, as by the express prohibitory edicts of the emperor. These have been occasioned equally by the natural dislike of of the Celestial government to movement of any kind (even to the healthy circulation of its subjects within the limits of its own dominions) as by the foresight of the real danger which the increasing population of Ty-o-an, or Formosa, is likely to prove. In fact ever since the Tartars first possessed themselves of this island, its history has been a series of constantly recurring attempts on the part of the people to throw off their allegiance, and of open struggles or insidious policy on that of the conquerors to keep them down. In fact money secretly lavished and promises made underhand to corrupt leaders, have been the real, whilst the large army kept up is the ostensible, means of subduing the insurgents; who indeed might scorn all military endeavours, for the loftiness and ruggedness of its mountains, the depth and intricacy of its forests, and the number of unconquered villages that lie in the east, would afford inaccessible retreats.

Notwithstanding the near proximity of this island to the coast of China, it is supposed never to have been discovered by that nation until about the year 1430, when a eunuch returning from a western voyage was driven on its shores by a furious tempest. He appears to have carried home flattering reports to his countrymen, who, however, did not attempt to profit by the discovery until nearly two centuries afterwards, not very much anterior to the Tartar conquest. At first their situation on its shores was very equivocal, for they seemed to linger there rather by sufferance than from any supposed power or acknowledged right of occupation. About this time, however, they exerted an act of sovereignty by making over a certain portion of the island to the Dutch, or at least granting them permission to erect a fort at Ty-o-an, which came to pass in the following manner:—

The Dutch wishing, in 1629, to annoy the Spaniards in their tradings from Manilla to Macao, sent out a fleet to build a fort upon the Viscadore Islands, lying nearly midway between Formosa and the mainland. This they effected, and manned it with twenty pieces of cannon; but not by the labour of their own hands, for in order to make the work progress more vigorously, they kept cruising about and seizing all the Chinese ships that they could find, the crews of which, to the number of fifteen hundred, they employed in constructing the fort.

Meanwhile the Dutch were in treaty with the Chinese admirals, who hung about with a fleet of twenty sail. After some time had been spent in negotiations, a proposal was made that the Europeans should quit the Viscadore Islands, and retire to Formosa, in which case the mandarins promised to pretend to be ignorant of their presence. With this proposal the Dutch, flushed with success, at first refused to comply, and sent as an answer eight vessels to plunder the coast, in which expedition

* 'History of Palestine,' b. iii., c. 4, p. 435.

they succeeded without any opposition, and obtained many prisoners, one of whom they dispatched to the Chinese officers with new proposals for a free trade. This was promised on condition of the Dutch retiring from the Viscadores, which they again refused to do, and accordingly the negotiations proved once more ineffeetual.

But the Chinese now proceeded to take more vigorous measures. They sailed from Amoy with a hundred and fifty junks, and landing an armed force of four thousand men on the principal island, raised a fort within two leagues of the Dutch stronghold. This alarmed the intruders, and the third time the negotiations were attended with success, and the Dutch agreed to retire to Ty-o-an, where they built Fort Zealand, the stones for which were brought by the Chinese themselves from the continent in junks, and the trade was opened upon advantageous terms. This prosperity did not, however, long continue. The Tartars entered China; and the Dutch were at first undetermined as to whose cause they should espouse. They hesitated, and the Tartar triumphed. To him then they offered their services, but, as is well known, paid dearly for it; for the popular admiral Koshinga, stirring up the people, and collecting a great naval force, overpowered the bewildered garrison, expelled them from the island, and ereeted himself as an independent sovereign, ere the phlegmatic directors at Batavia could form any plan of defence, or come to any resolution whatever. Since that time the island has again been united to the empire, but is held by a very precarious tenure, as the inhabitants are extremely hostile to the Tartar dynasty. They are in fact ready to receive with open arms any invader who will guarantee to them the enjoyment of their own municipal laws and domestic customs. They have never forgiven the Mantchoos the wanton or politic, but at any rate arbitrary, changes made in their customs; and no insult is so long remembered as one which affects every member of the community. To introduce arbitrary innovations in a trivial matter may break the spirit of a sensitive people, if they do not repel the attempt indignantly at the moment; but with a nation of the long-remembering hatred of the Chinese, the experiment, though it may have been judged necessary, was a dangerous one, and it has certainly not produced the desired effect.

The means at first resorted to for restraining the discontented spirits of Fo-kien from passing over to this island were passports of exceedingly difficult access; but this proving useless, an entire yet equally ineffectual prohibition succeeded.

It may not be uninteresting to remark that Formosa was not formerly unvisited by English merchants, and that in 1623 the Chinese ambassador at Batavia offered the English, as well as the Dutch, an establishment at Ty-o-an, which, after some negotiation, was accepted, and a British factory seems to have flourished for a few years; but the conquest of the Tartars, and the wars with Koshinga, whose party the English merchants espoused, entirely spoiled their prospects, and when the island was finally annexed to China, they were so tormented and harassed with taxes, detentions, and other vexatious proeeedings, that in 1689 the factory was withdrawn, and the Court of Directors wrote to Madras, saying, "Ty-o-an is good for nothing now; and we would not have you settle any factory there again."

The Viscadores form a small cluster of thirty-six islands, chiefly valuable, however, as a commercial or naval station. Large tracts are totally destitute of all vegetation; so much so indeed, that Van Mailla asserted that when he visited them he saw only one stunted tree, and a few bushes scattered here and there on the sandy hillocks. But other quarters abound with inhabitants, and numerous herds of cows, which feed on the somewhat rank grass with which the meadows abound. There are here also great multitudes of birds, especially a fine species of cocks; and the ground produces potatoes and many kinds of fruits. During the rainy season the inhabitants gather fresh-water in cisterns and pools. The port is very good, lying between two islands, with an opening north and south. On the eastern side stands a town and a fort, built on the same site as that formerly erected by the Dutch, and still remembered as the "Fort of the Red-Hairs." In the town itself resides a mandarin, whose duty it is to inspect the vessels that pass to and fro between Formosa and the continent.

The city of Ty-o-an lies about forty or fifty miles to the south-east of the Viscadores, and is proteeted from the sea by a long narrow island that extends in front of it. The harbour is spacious but shallow, and the entrance is so difficult that it is comparatively of little importance. There were formerly two openings, but one is now impracticable. The other is commanded by a tolerable fort, and a large garrison is continually kept under arms. The governor is a mandarin of high rank, who bears the title of supreme governor of Formosa, though in fact even now the Chinese authority does not extend over above one half, that is, the western side of the island; the other is divided off by a long ridge of mountains rising to a great height, and covered by thick and almost impenetrable forests; and in these, and on the eastern shores, the rivers, and the lakes, yet untamed savages wander in the naked simplicity of nature, with their canoes and lances, and bows and arrows. These it was who gave such a rough reception to the fugitive Benyowski and his crew, a reception perhaps warranted by ill-treatment, and veiled over from the usual motives that cause men to seek pity for themselves by shrouding the wrongs they have committed against others. However this may be, the usual acquired superiority of the Europeans manifested itself in dreadful massacres, and the natives had reason to look with distrust on any future attempt at exploring the country. This probably has been one of the principal reasons of the eastern coast of Formosa being so little known to the Europeans, as well as to the Chinese.

There is a tradition that the latter people, in an expedition which they made to the back of the island, also gave the inhabitants warning of their cruel and rapacious appetites; for incited by the reports of gold and silver mines which prevailed long before the Chinese had mastered any portion of the coast, a number of adventurers sailed thither with a junk on a voyage of discovery; and on landing were treated by the natives with distinguished kindness. No trace of mines appeared, save a few ingots of gold carelessly scattered about some of the cottages as if of no value. These, however, provoked the cupidity of the Chinese, and accordingly having succeeded in intoxicating their hosts, a general slaughter ensued; with their miserable and blood-stained profits they then returned to the junks and sailed back to their own ports.

If, however, cupidity has been disappointed in the hope of the existence of mines (of the precious metals at least, for white and brown copper and pit-coal are frequent in the mountains), honest merchants have reaped the benefit of the possession of the island. The capital is at present a large and opulent city, carrying on an extensive commerce, and containing in its bazaars, shops, and warehouses, every article of use or luxury which is prized in that quarter of the world. The island itself furnishes rice, sugar, sugar-candy, tobacco, linen, hemp, and the bark of certain trees used in various manufactures.

From abroad are brought varnishes, porcelain, European commodities, and silk. Of the latter little is manufactured in the island, for the cultivation of mulberry-trees has hitherto been very much neglected. The soil, however, is favourable, and industry might effect much.

All these articles and many more are sold in long streets, covered with awnings during seven or eight months in the year on account of the excessive heat. Extensive ranges of shops flank these on either side, in which a tasteful arrangement of the various articles

offered for sale not only tempts purchasers, but renders the bazaar an agreeable promenade. The general acknowledgment, however, of this latter fact congregates crowds that sometimes become disagreeable, and besides the galleries are not paved with sufficient care and attention to comfort or cleanliness.

In addition to the articles above mentioned, smoked venison is much sought after, and very plentiful. Indeed stags and monkeys, which make their appearance in troops, are perhaps the only wild quadrupeds on the island; for if there exist any bears, wild boars, wolves, or tigers, it must be in the eastern mountains, for they are never heard of on the plains. Nor are the tame animals more numerous, which may perhaps be accounted for from the comparative late occupation of the country by a civilised race. Sheep, goats, pigs, and even horses and asses, are very rare, it being there the custom for oxen to serve the purposes to which these two latter animals are applied in other countries; and we will venture to assure our readers that a mandarin on the brawny back of a well-fed ox would make no contemptible figure, especially as the furniture is generally very rich, were it not for the ludicrous gravity of the one and the well known harmlessness of the other.

In spite of the mountainous character of the inland scenery, there are towards the shores on either side vast plains and lowlands, divided into rice-fields or orchards. The latter produce bananas, oranges, mangosteens, cocoanuts, pomegranates, figs, &c., with European fruits, introduced by the Dutch, such as apricots, peaches, chestnuts, and grapes. A fine species of water-melon makes up in some measure for the extreme insalubrity of the water. The evil qualities of the latter will perhaps prove the most considerable obstacle to any European settlement on this island: the only water as yet known which is tolerable is that of the capital, which the mandarins were careful to supply to the Jesuit missionaries, by sending it in cart-loads to their habitations. It may also be remarked that the island abounds with sulphur, and that earthquakes are exceedingly frequent.

The trees above mentioned, with the tobacco and sugar plantations, and the deep green patches of rice (of which there are in some places two harvests in the year), give to the lowlands of Formosa the character rather of a large pleasure-ground than a mere agricultural country. Indeed all accounts agree in testifying to the justness of the name applied to it by the Portuguese navigators, for it may really be called "The Beautiful Island."

We miss, however, the usual characteristic of an Eastern country, in the extreme meagreness of the list of native birds. True it is that fowls, ducks, and tame geese are numerous about the farm-houses, but those richly adorned birds that generally deck the branches of the forests of the Indian Archipelago and of China are here extremely rare. Pheasants, woodcocks, and pigeons are almost the only birds mentioned, and though others doubtless may exist, this complaint has been general among travellers.

The rivers that water this island are numerous, and their woody embouchures add an additional feature to the rich landscape of the coast. Fish of all kinds abound therein, as well as in the lakes which occur here and there in the interior.

Before we conclude this part of our subject, it may not be amiss to give some account of the manners of the aboriginal inhabitants, especially as circumstances have taken place and others may occur to render whatever has any connection with this island extremely interesting to the British people.

The Formosans generally bear the character of excessive shyness towards strangers, but are at bottom of a good disposition. War, however, is their delight. Whenever the nature of the country permits, they are continually making forays, not only upon their neighbours, but also upon very distant villages. Embarking in canoes, they drop down along the coast, and falling upon some unprepared community, massacre every person they can find, man, woman, or child, sparing none; for there is no greater honour among these people than to be able to show the head of an enemy preserved in the same manner as is the scalp among the North American Indians.

Each village was formerly entirely independent of the other; but by degrees, as is usual amongst nations addicted to war, and where life and property are unsafe from frequent incursions, kings have assumed a certain authority, and now wage war for their territorial rights, the satisfaction of their own ambition, thirst of conquest, or other political motives, with the same arts and the same weapons as their more simple ancestors did for mere plunder.

Hunting fills up the interval left unoccupied by contention, or else lazy inaction in their huts. For here the men, as in several other barbarous countries, leave to the other sex the care of cultivating their fields. To the women also is confided the task of fishing for lobsters, oysters, or prawns, which form their favourite dish, next after rice, their staple production, and commonest as well as most admired article of food.

When a young man wishes to marry, he goes with music and song to court his lady before her own hut, and when by these means he has won her affections, leaves his father's house, and dwells in that of his father-in-law; for which reason daughters are more prized than sons, who there forsake their parents as soon as they come to a marriageable age; but the former only bring an increase of family, and consequently of riches and honour, since there are then more hands to wield the spear in the chace or the field.

The houses of the Formosans are larger than savages commonly take the trouble to build, and are of very elegant form, being raised each on a little mound, having a door corresponding to the four cardinal points of the heavens. The ornaments, both within and without, are deer and boar heads; and along the walls are generally hung their various implements both of war and peace. Their clothing is commonly of Chinese stuffs (for which they give in exchange the skins of the animals they kill in their hunting parties), or of a kind of cloth of their own manufacture woven of dog's hair.

They have no appointed day of rest, but have several religious festivals, at which they take occasion to enjoy themselves. They believe in the immortality of the soul, in future rewards and punishments, and have certain priestesses, who are as much feared and respected as was of yore the Delphian Pythoness. It should be remarked, however, that the punishments of a future life are directed rather against arbitrary offences, such as catching oysters out of season, disregarding the warnings given by the songs of birds, than against real crimes, as adultery, drunkenness, &c. Their gods have particular dwellings assigned them: for example, the principle of evil dwells in the north; of good, in the south; and in the east, the consort of the latter, who ever and anon growls in thunder, to bid her worse half be less sparing of his rain, or to water the fields of her good friends the Formosans.

Revenge.—Revenge is a kind of wild justice, which the more man's nature runs to, the more ought law to weed it out: for as for the first wrong, it doth but offend the law, but the revenge of that wrong putteth the law out of office. Certainly, in taking revenge, a man is but even with his enemy; but in passing it over, he is superior.—*Lord Bacon's Essays.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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THE ABBEY OF JUMIEGES.

[Procession of the Loup Vert.]

FOLLOWING the course of the Seine from Hâvre towards Rouen, we find, at a part which is geographically distant only about four leagues from the latter place, a small peninsula, formed by the windings of that noble and interesting river. This peninsula may be said to have been originally occupied by the site of the Abbey of Jumièges, for although it is considerably more than three leagues in circuit, the monastic buildings were on a scale of corresponding extent and of great magnificence. In the life of the first abbot the monastery afforded a home, with every requisite accommodation, to no less than nine hundred monks and one thousand five hundred lay brothers, or in all two thousand four hundred persons.

Jumièges was founded in 654, by St. Phillibert, the first abbot, the ground being given by Clovis II. and his wife St. Bathilde. It was at that period a desolate and unhealthy place, marshy, and covered with a forest, which extended for some leagues along the banks of the Seine. The church, built in the same or in the following year, was destroyed by the Normans in 841, and the abbey greatly injured: ten years later its ruin may be said to have been consummated by the same hands, when the monks were killed or dispersed. In 930, William Longsword, son of Rollo, raised the monastery from its ruins by extensive reparations, and in 1067 Jumiéges regained its original splendour under the abbacy of Robert II. At this period it appears the old church was entirely pulled down, for we find that this abbot laid the foundation of a new one on its site. This church was consecrated in the presence of William the Conqueror: the remains which exist are a part of this edifice. The east end and the choir were rebuilt in 1230, in the pointed style. A second consecration took place in 1252, by which time the alterations of the east end, that were made about this period, were probably completed.

Of the conventual buildings of Jumièges, there remains only the gate-house, which is converted into a dwelling. A large portion of the church was pulled down at the Revolution, but the parts which remain are fortunately the most ancient, and those which produce the best effect. The pointed reconstructions are in ruins, but the Norman towers survive. This noble pile, the church, was originally two hundred and sixty-five feet long and sixty-three broad, and still presents to us a fine specimen of the grand simplicity of Norman architecture. It has little or no ornament; the whole effect is produced by size, height, and a few great features, such as the magnificent arches under the central tower, the length, breadth, and height of the nave, and the elevation of the western façade. The arches of the nave rest on piers, to which half-pillars are attached, alternating with single pillars, which are built in courses. All the capitals are plain, unless the rude imitation of leaves painted upon some of them be considered an exception. Above the aisles, on either side of the nave, are wide galleries. The roof is entirely gone. The entire edifice is well con-

structed of blocks of chalk stone, seamed with flint, brought from the neighbouring quarries. Besides the central tower, originally one hundred and twenty-four feet high and forty-one square, and surmounted with a wooden spire of admirable workmanship and prodigious height, there were towers at the angle of the western front one hundred and fifty-five feet in height: the former is nearly gone, but the last remain. These are octagonal, but do not exactly correspond. Their height renders them very serviceable as landmarks to navigators. The west portal is remarkably plain, and of Roman character: its round arch, without a single moulding, rests on two pillars.* Adjoining the abbey church is a smaller one, of good architecture, in the advanced pointed style. It was in existence prior to 1330.

In the abbey church was deposited the heart of the beautiful Agnes Sorel, who resided in the neighbourhood, a circumstance to which, doubtless, may be attributed her lover's (Charles VII.) attachment to Jumièges, who added an apartment to the abbey for his own especial use. There was also here at one time a tomb, with the figures of two youths, called the Tombs of the Enervated. The story connected with this monument is too interesting to be omitted in any description of Jumièges. Clovis II., successor to Dagobert, had five sons: having gone to visit the holy sepulchre at Jerusalem, he left the regency to his wife, St. Bathilde; but the lords, who had not accompanied Clovis, revolted against the regent, on the pretence that a stranger (Bathilde was a Saxon) ought not to rule in France. Two of the eldest sons of the king and queen joined the conspirators, who were, however, quickly put down on the return of Clovis, and severely punished. The judges would not condemn the children of their sovereign. "Then," says an old chronicler, "the queen Bathilde, inspired with the spirit of God, which could not leave such an excess unpunished, choosing rather that her children should be chastised in their bodies than be reserved for eternal torture, by a pitiful severity, and in order to satisfy Divine justice, declared them unable to succeed to the crown; and forasmuch as that the strength and bodily power which had served them to rise against their father consisted of their sinews, she ordered that those of the arms should be cut, which were thus rendered impotent. She then caused them to be placed in a little boat, with provisions, on the river Seine, without rudder or oars, and assisted only by a servant to administer to their necessities, leaving all to the providence and mercy of God, under the care of whom the boat went down so far on the Seine that it reached Normandy, and was stayed on the shore by the ancient monastery of Jumièges; of which, St. Phillibert, the first abbot, when informed, went to find them, accompanied by his monks, and knowing who they were, and the cause of such an event, and admiring their features and august air, received them graciously, and placed them in his monastery, where by his prayers they recovered their health, and were instructed in the monastic discipline."

The procession shown in our engraving refers to a story of a very different kind, and is a curious vestige of the old legendary miracles. It appears that St. Phillibert was also the founder of the convent of Pavilly, distant about four leagues from Jumièges, and of which St. Austreberthe was the first abbess. That pious lady, having charged herself with the washing of the linen of the vestry of Jumièges, employed an ass to carry the things from the one monastery to the other, and who was so docile as to perform this regular duty without a guide. One day a furious wolf devoured the poor messenger, but the abbess at the instant coming up, charged the wolf to fulfil the duties of the defunct, by taking the packet which the ass bore to Jumièges. The wolf not only obeyed on this particular occasion, but continued to fulfil the duties of his office with exemplary zeal. A chapel, constructed in the eighth century, marked the spot where the ass was killed, and this, when ruined in the progress of time, was replaced by a stone cross, which was standing till within the last sixty years or so. The memory of the miraculous event is now commemorated annually at Jumièges, by the custom of which we are about to speak, namely, the procession of the Green Wolf. On the 23rd of June, the brethren of St. John the Baptist (the bell-ringers) take to the hamlet of Conihout the new master of that association, who, surnamed the Green Wolf, and habited in an immense green robe, and high conical bonnet of the same colour, places himself at the head of his brethren, and the whole body march, chanting the hymn of St. John, midst the noise caused by the discharge of fireworks and musquetry, and with the sacred cup and banner displayed in front, towards the place called Chouquet. Here the procession is met and joined by the rector and rural clergy of the district, after which it moves forward to the parish church, where vespers are immediately chanted. A meagre repast, prepared at the "Wolf" house, and dances, which take place before the door, occupy the rest of the day until the eve—St. John's eve, a festival generally observed in Catholic countries—sets in, and the fires by which that festival is particularly distinguished have to be lighted. After having chaunted Te Deum around the wooden pile, which is then lighted, amidst the ringing of bells, by a young boy and girl decorated with flowers, and whilst an assistant gives out, in the Norman dialect, a sacred chant, the wolf in his costume, and the brethren generally, take one another by the hand, and run round the fire after him whom they have chosen to be wolf for the next year. We may conceive that these singular hunters thus arranged—the first and last of their number alone having a hand at liberty—find it difficult to catch the fugitive, who must nevertheless be hemmed in and seized three times before he is considered to be taken. During all this time the latter amuses himself at every opportunity by using a thick stick, with which he is armed, on the persons of his pursuers. When, however, he is at last caught, and that strange ceremony terminated, the brethren return to the house of the "wolf," and again partake of the repast. During these proceedings a word in the slightest degree immodest, or not pertinent to the solemnity, is signalised by the obstreperous sound of some bell belonging to the fraternity, placed for the occasion under the care of one of their number, who acts as censor, and when the noise is arrested, the offender is condemned to recite, upstanding, and with a loud voice, the Paternoster. The moment, however, the clocks announce the hour of midnight, liberty the most entire, to say the least of it, succeeds to constraint, bacchanalian chants to religious hymns, and the harsh music of the village minstrels can scarcely be heard through the uproarious voices of the convivialists. They retire to rest at last, but on the morrow the festival recommences. Another procession is formed, bearing an enormous loaf of bread, surmounted with a green pyramid ornamented with ribands. After this the bells of the monastery are placed upon the steps of the altar, and confided to the care of the future "wolf," and thus these singular proceedings are terminated.

* For this architectural description of the abbey church of Jumièges, we are mainly indebted to H. Gally Knight's 'Architectural Tour in Normandy.'

HISTORY OF A COAT.—No. I.

The very elevated rank which the manufacturing reputation of England maintains is likely to induce in us the flattering belief that Englishmen are really more clever than their neighbours; that the woollens and cottons, the porcelain and glass, the iron and the cutlery of England, owe their excellence to the superiority of our workmen over those of the Continent. But however just it may

be to attribute a portion of the excellence to this source, there are two other circumstances which should not be lost sight of, viz. the great richness of England in those mineral treasures, particularly coal and iron, which are indispensable to the construction of machinery; and the impetus which a demand is sure to give to inventive ingenuity, by which new processes, and shorter modes of conducting old ones, are devised. It is to all these circumstances combined that we are to attribute the possibility of performing a feat which perhaps no country but England could witness. It was stated a few years ago, that the late Sir John Throgmorton on one occasion sat down to dinner in a coat, the wool of which was on the backs of his own sheep that same morning. The animals had been washed and sheared; the wool washed, carded, spun, and woven; the cloth scoured, fulled, sheared, dyed, and dressed; and a coat made from it by a tailor, between sun-rise and the hour of seven in the evening. It scarcely need be said that all the preparations were made beforehand, and speedy modes of drying, &c. adopted: we may also presume that the cloth produced was not "extra-superfine Saxony;" but still, if the statement itself be correct, it is quite sufficient to excite our surprise and admiration. The processes here enumerated are very varied; and it may not be uninteresting to the reader to follow us in a brief description of the steps by which the coat of a sheep becomes transformed into the coat of a man; this description may be introduced by a notice of the *history* of the woollen manufacture.

The hair or wool which grows on the backs of animals has, from an early period, been one of the materials from which men have provided themselves with clothing: so far different ages agree; but the distinguishing feature between the early times and the present is the degree of preparation which the substance undergoes before it assumes the form of a garment. In a barbarous state of society, whether in past or present ages, the savage makes a garment of the skin of an animal, wearing the hairy or woolly side next the skin, for the sake of warmth. This custom was alluded to by Juvenal, who, in speaking of a miserly person, says:—"To guard himself against the cold, he does not wear the costly clothing of the luxurious Romans, but the skins of animals, and these even inverted, that is to say, with the hairy side turned inwards, without caring whether the appearance be agreeable or not." When the barbarian rose one grade in the scale of society, the unsightly appearance of the fleshy side of the skin prompted him to conceal it, and to wear the hairy side externally. But still such a garment must have had the disadvantage resulting from an animal substance being worn in an almost unprepared state near the skin; and if the skin to which the fur, hair, or wool was attached underwent any process analogous to that of tanning, the hairy surface would be likely to be injured thereby.

When the efficacy of hairy or woolly substances in furnishing warm garments for the human body was proved, men were naturally desirous to try whether these substances, removed from the skin or pelt on which they grew, might be combined into a woven or otherwise continuous material; and wherever or whenever this was first done, the woollen manufacture may be said to have commenced, for it owes its peculiarity, not to the weaving at the loom, but to the peculiar property of *felting* which is possessed by woolly substances, and which we shall hereafter explain. It must be borne in mind, however, that the fur of the wild animals usually captured by the hunters was not of such a nature as to bear weaving and felting; and that animals more or less resembling the *sheep* are those which, on account of their exterior coat being *woolly* rather than *hairy*, have always been sought after for this purpose: the history of the woollen manufacture depends, therefore, in some respects, on the history of the sheep.

The sheep is supposed to have first come from Africa, but that so long as it was domiciled in that parching district the covering bore more resemblance to hair than to wool, and that it was not until that animal was introduced into the milder climates of Southern Europe that the covering obtained that quality which fits it for the felting process. It is supposed that the Egyptians, the Greeks, and the Romans were the first nations who became acquainted with the woollen manufacture, and that after the fall of Rome in the sixth century, the manufacture remained dormant for a considerable period. The revival of it took place in the Netherlands, and from thence spread gradually to other nations of Europe. Dr. Ure states:—"In the middle ages, Spain seems to have abounded in fine-wooled sheep, of the Tarentine breed, which it originally derived from its ancient Roman masters. So far back as 1243, the woollen cloth from Barcelona and Lerida is spoken of with admiration, and as being in high esteem at the gay court of Seville in the reign of Pedro the Cruel. Innumerable flocks existed in Spain in the time of Charles V., of which so many as 30,000 belonged to one shepherd, and served to supply foreign nations with the softest wool. The finest wools then went to the Italian states, to the amount of many thousand sacks annually, at from forty to fifty gold ducats each; that is, from 10*l*. to 12*l*. of our present money."* The French woollen manufacture appears to have first attained a degree of importance in the seventeenth century; but it soon arrived at a point of excellence unequalled in any other country at that period.

The woollen manufacture in England has been one of the staple sources of national wealth; indeed, before the extraordinary rise of the manufacture of cotton, that of wool was considered by many persons as the most important in the range of English industry, and one of the longest standing. It is probable that the Romans brought with them into England the art of fabricating garments from sheep's wool; and indeed they established at Winchester a manufactory of sufficient extent to supply the Roman soldiery with clothing. As long as the Romans remained in Britain, the manufacture appears to have flourished; but this, as well as many other advantages resulting from the residence of the Romans in this country, was lost during the subsequent turmoils between the Saxons and the Danes. It revived again, however, after the reign of Alfred, and in the tenth century it had so far risen in importance, that the fleece of a sheep was valued at two-fifths of the whole animal, a much larger proportion than that at present observed.

The wool employed down to about the middle of the thirteenth century was wholly English; but at that period the demand for fine cloths made from Spanish wool was so great among the higher classes, as to lead to the introduction of wool from that country. This was soon afterwards prohibited by law, on the plea that it would injure the English wool-growers; but laws of this kind are generally incapable of being maintained against public opinion, and we find that, from the year 1240 to 1330, most of the cloth worn by the gentry was made from Spanish wool; while the wool of England, being in some measure deprived of a home market, was sent to the Netherlands to be manufactured into inferior clothing. The English manufacturers had frequent opportunities during this period of observing the superior skill of the Flemish artizans in working up the wool into broadcloth, and, by inviting some of them over to England, the home manufacture was so much increased, both in extent and in excellence, that the legislature thought the time was come for prohibiting the exportation of British wool, under the idea that British interests would be consulted by the manufacturers using no wool but British, and by the wool-growers supplying no manufacturers but those of England; thus excluding both import and export dealings with other countries. But this short-

* 'Philosophy of Manufactures,' p. 132.

signated policy was soon found to be based on a wrong system, for the wool-growers had a large stock gradually accumulating in their warehouses, arising from the supply being larger than the English manufacturers could consume.

By degrees, as the legislature adapted its measures to the exigencies of the trade, the woollen manufacture obtained a firm footing in England, and maintained an important position in the time of Edward III. The seat of the manufacture is supposed to have been principally in Yorkshire, but partly also in the west of England, and at Cranbrook in Kent, where the Flemings who were invited over by Edward III. settled.

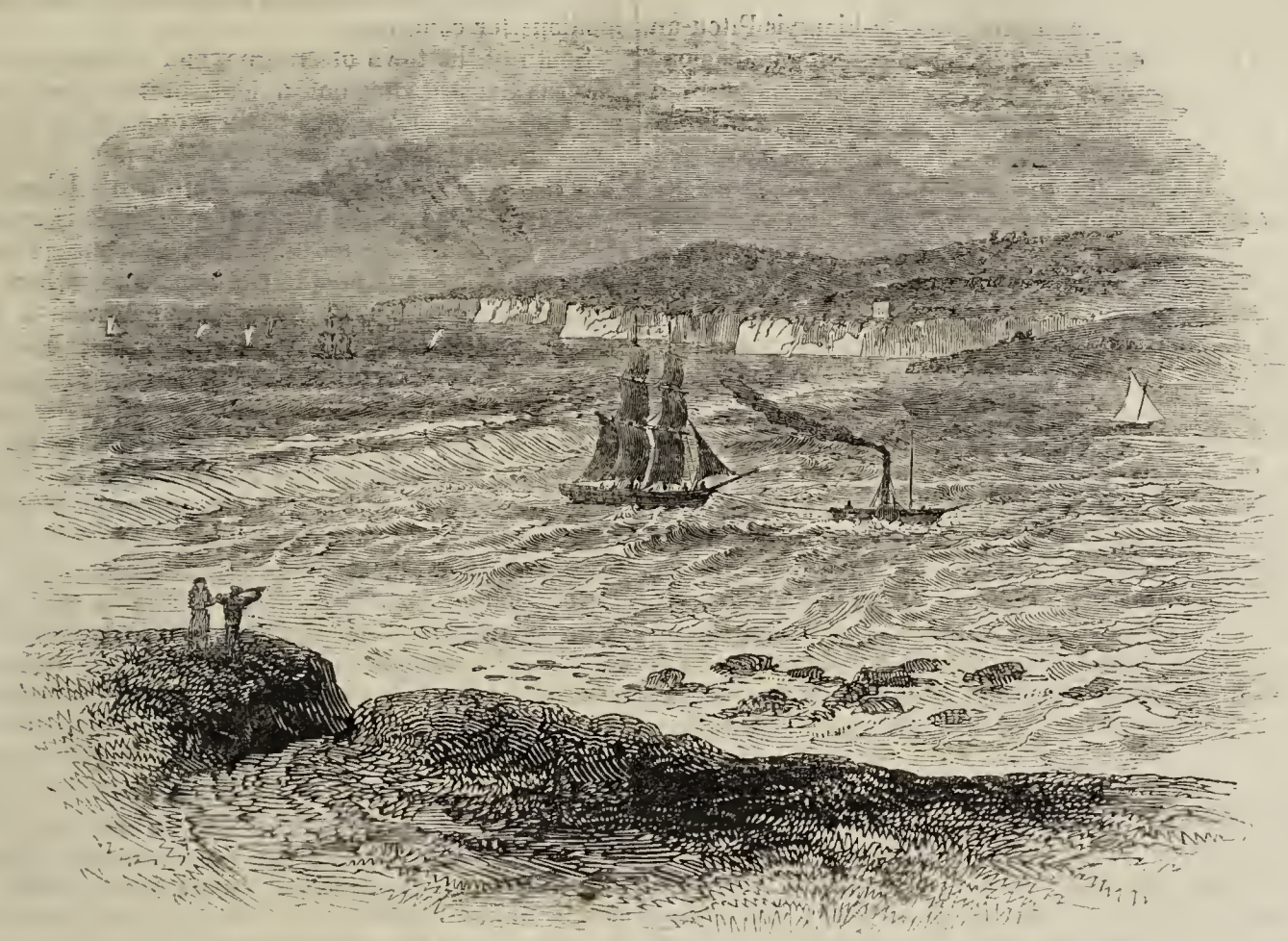
For two centuries after this period the woollen manufacture appears to have been steadily increasing, and occasional mention is made of it by most of the chroniclers and annalists of that period. It is recorded that, in 1520, the three most famous clothiers or cloth manufacturers were Cuthbert of Kendal, Hodgskins of Halifax, and Martin Brian of Manchester, each of whom kept a great number of persons at work—spinners, carders, weavers, fullers, dyers, &c. Soon after this the manufacture was extended to five towns in Worcestershire, and the quantity produced being more than the home consumption required, there commenced an export trade of manufactured cloths: this was in the reign either of Edward VI. or of Queen Mary, and the amount of export soon increased to two hundred thousand pieces of cloth annually. In the beginning of the seventeenth century the manufacture was further extended by the introduction of what is called medley or mixed cloth, for the production of which the west of England has been ever since celebrated; and these and other circumstances proved so advantageous to the manufacture generally, that by the end of the same century the total annual produce of woollen goods amounted to the value of eight millions sterling, of which about five millions' worth was consumed at home and three millions' exported.

By about the year 1770 the exports had reached the value of four millions annually, comprising the various woollen fabrics of bays, cloths, flannels, serges, says, stuffs, carpets, and worsted stockings. About the same period the demand for cloths of a fine quality became so large as to require the annual importation of from three to four million pounds of Spanish wool. In the year 1800 there was a parliamentary inquiry into the state of the English woollen manufacture, and some of the evidence there given was such as to convey an idea almost startling of the extent to which it had reached. The number of packs of wool grown in England annually was estimated at six hundred thousand, which, at eleven pounds per pack, would amount to six million six hundred thousand pounds: it was assumed that the manufactured goods were, on an average, worth about three times as much as the raw wool, and consequently that the value of the manufactured goods amounted to nearly twenty millions annually. But the most extraordinary part of the evidence was that in which the total number of persons, men, women, boys, and girls, engaged in this manufacture in England and Wales, was stated at three millions! Mr. Stevenson, in an able article on the statistics of England, in the 'Edinburgh Cyclopædia,' has carefully analysed the whole of the evidence given before that Committee, and has shown that it must be greatly exaggerated in every part, particularly in that relating to the number of persons employed in the woollen manufacture in 1800: this number he estimates at rather more than half a million, instead of being, as was stated in the evidence, three millions. Since that time more attention has been paid to the collecting of facts in statistical inquiries, and we will here give Mr. McCulloch's estimate of the probable extent of the woollen manufacture in England in the year 1833:—Number of long-wooled sheep in England, four millions; number of short-wooled, fifteen millions; five million pounds of English wool exported, thirty-eight million pounds of foreign wool imported; total value of woollen goods manufactured, twenty-one millions sterling, of which about six millions are exported: the number of persons employed, about three hundred and thirty thousand. It will be observed that this last estimate is even much within that of Mr. Stevenson for the year 1800; but we may remark that Mr. McCulloch is of opinion that Stevenson's estimate, small as it was in comparison with that given before the parliamentary Committee, is yet too large; and further, that the increased use of machinery has lessened the number of hands employed in some departments of the manufacture. As an instance of this we may state that, before the introduction of machinery in the processes preparatory to weaving, one thousand six hundred and thirty-four persons were employed to do that which could afterwards be done by thirty-five persons

In this brief historical sketch we have treated of the woollen trade in its whole extent; but in the descriptive details which are to follow we shall confine ourselves to the production of short-wooled fabrics, such as broadcloths.

Music and the Muscular Sense.—The divisions of the time in music in some degree depend on the muscular sense. A man will put down his staff in regulated time, and in his common walk the sound of his steps will fall into a measure. A boy striking the railing in mere wantonness, will do it with a regular succession of blows. This disposition in the muscular frame to put itself into motion with an accordance to time, is the source of much that is pleasing in music and assists the effect of melody. The closest connection is thus established between the employments of the sense of hearing and the exercise of the muscular sense. The effect of disorders of the nervous system is sometimes to show how natural certain combinations of actions are in the exercise of the muscular frame. The following is a curious illustration of what we have just been dwelling upon:—A young woman—who, by the bye, could not be taught to go down a country-dance—under a morbid mental excitement, in association with the organs of voluntary motion, began to exercise involuntary movements not unbecoming an opera-dancer. At one time she would pace slowly round the room, as in a minuet, with a measured step, the arms carried with elegance; at another time she would stand on the toes of one foot, and beat time with the other. On some occasions she would strike the table, or whatever she could reach with her hand, many times softly, and then with force. At length it was found that she did everything in rhythms. A friend thought that, in her regular beating, he could recognise a tune, and he began singing it. The moment this struck her ears, she turned suddenly to the man, danced directly up to him, and continued to dance until she was quite out of breath. The cure of this young woman was of a very unusual kind: a drum and fife were procured, and when a tune corresponding to the rhythms of her movements was played, in whatever part of the room she was, she would dance close up to the drum, and continue dancing until she missed the step; when these involuntary motions instantly ceased, and the paroxysm ended. The physician profiting by this, and observing a motion in her lips, put his ear close to her mouth; he thought he could hear her sing; and questioning her, she said that there was always a tune dwelling upon her mind, which at times had an irresistible influence upon her, and impelled her to begin her involuntary motions. In the end, she was cured by altering the time in the beating of the drum; for whenever she missed the time, the motions stopped. We may now ask what is this extraordinary disease? From being an excitable state of the nervous and muscular system, it will be called Chorea: but it is an instance of a natural combination of muscular actions morbidly produced; just as in hysteria, where we have the expressions of various natural passions exhibited, for example, weeping or laughing.—*Sir Charles Bell, Bridgewater Treatise, On the Hand*, p. 245.

TYNEMOUTH BAR, NORTHUMBERLAND.



[Mouth of the Tyne.—A Vessel towed across the Bar.]

Tynemouth Bar is a ridge of sand, stretching directly aeross, in front of the mouth of the river Tyne; and which is so far an impediment to the progress of the numerous vesscls bound to and from North and South Shields and Newcastle, as to allow of their passage only at certain states of the tide. The depth of the water on the bar varies from seven to eight feet at low-water, to sixteen or seventeen feet at high-water, during the ordinary periods of the year, but the spring tides inerease the depth at high-water to about twenty-two feet. The usual hour of high-water on the bar at spring-tides is three o'clock, but it is to be observed that a strong northerly wind will somctimes make it an hour sooner, and a strong southerly wind an hour later; there will also, it has been observed, frequently be two or three feet more water with the former than with thc latter. Within the bar the depth varies greatly—in some parts being only ten feet and in others as much as twenty-four feet at low-water. The entrance into the Tyne is, even under the most favourable circumstanccs, an operation requiring skill, care, and experience. The coasts on eaeh side are rocky; in front of that to the north, opposite to a little inlet called Prior's Haven, and to the left of the bar, is a dangerous rock called the Sparrow Hawk, whilst on the south, or to the right of the bar, is a scarcely lcss dangerous shelf of sand called the Herd Sand. All these circumstances combined make the spot somewhat dangerous in tempestuous weather. It appears from the books of the Trinity-house, A.D. 1672, that great storms and land-floods occasioned about that timc so many ships to be wrecked in the port of Tyne, that notwithstanding the lighthouses, the bar of the haven was unnavigable by night, some of the wrecks lying in the very middle of the channel. The importance of the navigation, however, has naturally caused every endeavour to be made to secure, as far as possible, its safety. Near the ruins of the ancient Castle and Priory of Tynemouth,* which, as we approach the bar, are seen standing on a peninsula formed of stupendous rocks on the northern side of the mouth of the river, is a lighthouse, whieh during the hours of darkness gives forth a brilliant and powerful radiance, and which is distinguished from the others more inland by its continual revolution. The lighthouse stands in the Castle-yard; it is of stone, built in the shape of a tower; and its lantern is sixty-two feet above the ground on whieh it stands, and one hundred and forty-eight feet above the level of the sea. Its light may be seen from a distance of six leagues. A little within the river and near the town of North Shields are two other lighthouses, the one (standing on a much more elevated position than the other) forty-nine feet in height, and the other seventy-six feet. It is through the assistanee rendered by these lighthouses that the mariner is enabled to cross the bar. He brings them into a certain relative position with regard to his eye, and thus conducts the vessel into the best channel, which is on the south side of the bar, close to the Herd Sand. Their light is only allowed to be seen when the tide is favourable, that is to say, in nautical language, from one-quarter flood to one-quarter ebb. In the day time, a flag is hoisted during the same state of the water. The advantage of steam in cases like this is too important to be passed without notice. Before its introduction, vessels were frequently obliged during bad weather and uncertain winds to wait within or without the bar, which they could not venture to cross; and loss and anxiety were the inevitable consequences. An adverse or variable wind is now of no greater import than that it neccssitates (if delay is to be avoided) the employment of a steam tug. Secure of this assistance, the approaching vessel waits patiently the approach of high-water, when, as soon as there is sufficient water on the bar for the size of the vessel, it attaches itself, full of confidence, to its little sturdy guide, is borne over the dangerous spot, and in a very short space of time finds itself floating securely on the wide and noble river.

* For an account of both these edifices see vol. iv., p. 140.

SKETCHES OF THE COASTS FROM SINCAPORE TO PEKIN.

VIII.—THE PROVINCE OF CHE-KIANG.

[Continued from No. 538.]

The first town of any importance in Che-kiang is Pitcu-an (lat. 27° 11′ N., long. 120° 22′ E.), possessing a spacious harbour, where ships, by changing their berths, can find shelter from all winds. The coast is extremely high, for the roots of the mountains which divide Fo-kien from Che-kiang stretch a great distance to the east. More inland they run out in a long arm, which almost divides the province into two parts, and about Tchu-tcheou-foo rise to a vast height, and present an extremely picturesque appearance, being covered with vast forests of all kinds of trees, but especially of pines, much used for house and ship building. The river which flows by the last-mentioned town holds on a winding course, bordered with lofty bamboos, as for as Ouen-tcheou-foo, situated near the sea, in a marshy plain surrounded by very lofty mountains. This town is exceedingly beautiful, so much so, indeed, that it is called by the Chinese the "Little Hang-tcheou," which, notwithstanding its hideous name, is the most beautiful city in China. The neighbourhood of Ouen-tcheou is fertile, and it enjoys the advantage of a good harbour, in consequence of which provisions are sold at a much higher rate than at Tchu-tcheou, where the difficulties opposed by the ruggedness of the mountains and the badness of the ways are such, that the rice there produced is to be had for almost nothing. Indeed the passage from Che-kiang to Fo-kien, although improved by the industry of the inhabitants, is so rugged, that it affords little temptation to commerce. In some places the carriers have to ascend or descend vast flights of steps winding along the sides of the mountains; and although at the summit of these are usually little covered places to rest in, yet this does not compensate for the excessive fatigue of climbing under a heavy burden in that hot climate. Indeed, this ridge is fit only to be inhabited by the bonzees, who delight in seeking out almost inaccessible places whereon to build their temples, sometimes ascending to the summits of lofty rocks, at others penetrating into the depths of rugged valleys far from the road. Other bonzees, however, erect little oratories on the wayside adorned with idols, and stand therein with tea ready for any thirsty passengers who may be passing by. They offer indiscriminately to all, but those only who make them a present are saluted with a bow; otherwise they stand as stiff as though they had no life.

To resume, however. Passing by Tai-tcheou-foo (situated on a very agreeable site), let us penetrate for awhile inland, and notice the famous town called Ken-Hoa, or the Flower of Gold, so named because near it is a hill that bears abundance of gold flowers, or wallwort. This city was one that held out bravely against the Tartars, so bravely, indeed, that Matee-to, the besieging general, although he had promised a complete amnesty, gathered the citizens together after their capitulation, and gave orders for a general massacre. He was obeyed, and forty thousand souls perished.

The trade of this town is great, and in it is made some of the best rice-wine in all China. It is also famous for its hams, which, as well as the wine, are cheap, and both are sold by the pound.

About twenty miles east of the shore of this province, and sixty south of Chusan, the islands called Queesan, the first of the Chusan group, make their appearance, between which and a rock overflown at high water, but seen by the Normanton in 1736, ships make their way for Chusan or Ningpo. It is impossible to give an idea by description of the labyrinthine passages which succeed. The reader will gain the best idea of them by consulting the map published with Sir George Staunton's account of Lord Macartney's embassy. It is worth remarking, however, that the English, in searching for Ningpo, failed to find it, in consequence of the intricacy of the passage, and fell in, instead, with Chusan, which has a spacious harbour, said, however, to be not very commodious for commerce.

South of the town of Ningpo, and increasing in height towards the sea, runs out a long promontory, round the point of which ships have to turn to gain the port. Before, however, they can attain this they must pass through Dumb Passage, lying between Deadman's Island and the continent. The origin of the former name is curious, for it was given by European sailors, in consequence of a remarkable custom of the Chinese, who, when passing this place in their junks, invariably maintain a profound silence, and impose it also upon others; because, say they, somewhere hereabouts a huge dragon is continually sleeping, who would certainly awake at the sound of human voices, and commit dreadful depredations.

Ningpo is situated at the confluence of two rivers, which, after their junction, flow towards the sea, bordered by salt-works, villages, and a low cultivated country, stretching on either hand to the foot of a ridge of lofty sterile mountains. This plain is nearly oval in form, and is intersected in all quarters by canals crowded with craft. Numerous hamlets and villages are scattered here and there, and the multitude of waters helps, or rather causes, the extreme fertility of the soil. Two harvests of rice yearly reward the labours of the husbandman; and cotton, vegetables, and the wax-tree contribute to render the province rich. From the sea are drawn many different species of fish, among others an extremely delicate and well-tasted one, of a beautiful green colour, called hoang, caught in the beginning of summer, and carried, in ice, for eating, over the whole empire.

The harbour of Ningpo, although the entrance is difficult, is very good, and much commerce is there carried on. It is visited by merchants from Japan and Siam. The entrance of the river is defended by a fort, built upon a hill, and excellent for a Chinese construction. Beyond this the banks, as we have said, are very low, which render dykes necessary. The town is situated about eleven miles up the stream, and its neighbourhood is soon made known to the traveller by the incessant hammering of the shipwrights, or rather junkwrights. The fortifications were formerly of great strength, but are now decayed. There are five land-gates and two water-gates, the latter being great arches cut through the walls. It contains few public buildings worthy of notice, and the streets are, as usual, narrow, and obstructed by sheds and other appendages to a Chinese shop.

The great island of Chusan lies to the east of Ningpo, and is surrounded by many hundreds of others, to some of which the English sailors have given those fantastical names with which they so often disfigure our maps, as the Whelps, the Mouse, the Tinker, Buffalo's Nose, the Calves, and Starboard Jack, called by the Chinese Kin-se-hoia. About this latter island the bottom is so level that it is a rendezvous to thousands of fishing-smacks, between two of which the Chinese with great difficulty drag their nets.

The capital of Chusan is Ting-hai, the way to which from the port is over a plain, intersected by numerous rivulets, and exceedingly well cultivated, so much so, indeed, that the road is narrowed almost to a path in order to save ground. The walls are thirty feet high, with square stone towers at intervals, unprotected by cannon, except that at the gates there are a few pieces, which are very old, and of wrought-iron.

Of all the cities of Europe, Venice is the one to which Ting-hai, though built on a smaller scale, bears most resemblance, being surrounded as well as intersected by canals, the bridges over which are steep, and ascended by steps, like the Rialto. The streets are narrow alleys, paved with square flat stones. The houses are low, and the attention

to ornament is chiefly confined to the roof, the tiles of which are luted and plastered over, lest they should be blown away by the frequent storms. On the ridges are uncouth figures of animals, with other decorations, in clay, stone, or iron. The shops are extremely gay, even coffins being here painted in lively colours. Dogs, poultry, and fish, the latter in tubs of water, are exposed alive for sale; eels, as in England, in sand. The numbers of shops where tin-leaf and sticks of odoriferous woods are sold to burn in the temples, or before household idols, evinces, in no slight degree, the superstitious temper of the people.

Both sexes wear loose garments and trowsers. The principal distinction between the men and the women consists in the head-dress. The former wear a straw hat, and have their hair shaved, with the exception of a long tuft on the back of the head; the latter preserve the whole, plait it in an elegant manner, and twist it up in the fashion prevalent among the ancient Greek women, as shown in their works of art.

Most of the Chusan islands consists of hills rising with a regular slope and rounded on the top, as though their points and angles had been gradually worn away and softened by the action of the weather. Their formation is certainly not to be attributed to the deposits of the river at whose mouth they lie, for they rest upon a foundation of grey and red granite resembling porphyry in all things but in hardness. They are rather the remains of the continent, the softer parts of which have been washed away, leaving the more stubborn rocks untouched. The channels thus furrowed out are in some cases excessively deep, in others they are not to be passed even by the Chinese junks themselves.

The general scenery of the islands is very picturesque. Some are totally bare; other produce a little grass, a few reeds and bushes; in others again there are beautiful verdant spots with dwarf fruit-trees; oaks, and the Weymouth pine. Some are excessively beautiful, as that called Poo-too, described as a perfect paradise, and chosen, on account of its natural beauties, by a set of religious men, who, to the number of three thousand, possess the whole of it, and live in a state of celibacy. It contains four hundred temples, to each of which are annexed dwelling-houses and gardens for the diversion and accommodation of the bonzees. This monastic institution is well endowed, and is famous throughout the empire as the abode of sanctity.

Kintang is also a beautiful island diversified by hill and dale, clothed with verdure, and abounding in fuel and water. The valleys all run in the same direction, and are intersected by rivulets, the fields on whose banks yield rich harvests to the inhabitants.

Let us now penetrate to the extremity of the vast æstuary of the river Tsien-tang-kiang. On the left bank the plain extends to the town called Chao-hing-foo, intersected, like Ting-hai, with canals, which also supply with clear water the ditches, one of which flows on either side the fortifications. Some of the houses of this *foo* are built of a very white stone got from a vast and almost inexhaustible quarry in a mountain between five and six miles from the gates. Near the walls are two monuments, one of a very ancient date, erected over the remains of Yu, who is said to have recovered all the eastern provinces from the sea; another, in memory of the same monarch, but erected by Kanghi.

The inhabitants of Chao-hing frequently make parties of pleasure to a mountain in the neighbourhood, called, from some real or fancied resemblance, the Monkey Mountain; upon which is situated a pleasure-house where refreshments are always to be obtained. After the repast, visitors may retire from the dining-hall to another spacious apartment overlooking a deep sheet of water, where are kept certain large tame fish which rise to the surface of the water, and come in shoals to feed upon the crumbs thrown out to them by the visitors from the windows.

Hang-tcheou is one of the richest cities in the empire, in consequence of the excellence of its situation, the number of its inhabitants, and the great commerce in silk carried on by its merchants. The Chinese call it a paradise upon earth, and having done so, when they wish to praise the beauty of a city, as we have seen in the case of Ouen-tcheou, they liken it to this one, whose form is nearly circular, and is defended by fortifications of great thickness. Like almost all the other cities of this province, Hang-tcheou is intersected by frequent canals of brackish water, upon which there are numerous boats inhabited like those at Canton. The streets are adorned with arches and high towers; whilst beautiful pleasure-gardens, filled with every species of flower and tree that contributes in China to charm the senses of sight and smell, enliven the banks of its river.

This district may fitly be called the Land of Silk, for within the city walls there are said to be at least sixty thousand workmen of it, and in the villages round about numberless others. Among other articles of manufacture, taffetas, flowered and plain, are here produced, and esteemed the best in China.

But one of the principal attractions of Hang-tcheou is the neighbourhood of the picturesque lake, near six miles in circumference, called Si-hou. It is situated in the lap of a green valley, and on its banks grow clumps of the orange, the citron, and the lemon-tree. On all sides the green sward slopes into the waters and is continued by a fringe of the Sien-hoa, or sacred lotus (*nelumbium*), with its gigantic trunk and yellow blossoms, which spread over the surface, and rise and sink as the ripples and wavelets come and go. Beyond this the lake sparkles, and stretches forth like a sheet of molten glass, painted here and there in the richest hues by the shoals of blue, silver, or golden fish that follow the elegant pleasure-barges in which, clothed in silk fresh from the loom, the Chinese make their way through the intervals left in the long causeways, towards the green and flowery islands in the centre. Here, amidst temples and bowers and groves, with song and laughter the Chinese pass their day, and towards evening stroll along the causeways and light bridges, or are wafted in their boats to the shore, enjoying the cool air from the sea, and gazing at the pagodas, the vast monasteries of bonzees, the royal palaces, the villas, the lofty porticoes of which lift their fanciful forms above the trees.

The last town of this province which comes within our plan is Kia-hong-foo, situated not far from the northern shore of the great æstuary of Hang-tcheou, on a line with Silver Island. This part of the country is intersected by canals, the banks of which are of hewn stone, and dotted here and there with small lakes. The town is large, well peopled, and mercantile; and there is scarce a house in which silkworms are not fed. In the neighbourhood, towards the approach of winter, numerous little birds are taken, which are preserved in rice-wine, and sold throughout the year. The lobsters caught on the shores are esteemed very good, and are always to be had in great numbers.

The bridges in this city are numerous, and the arches in the streets of frequent occurrence. The many-storied towers also of which so much has been said, are in great numbers, no less than fifteen being to be met with on one canal flowing westward of the walls.

The province of Che-kiang is partly mountainous and partly plain. In the former circumstance it approximates to Fo-kien, in the latter to the maritime parts of the neighbouring province of Kiang-nan. We shall therefore confine ourselves in our next article to a brief notice of the port of Shang-hai and of the mouths of the two great rivers of China, since it would be tedious to proceed with an enumeration of cities all having pretty nearly the same

characteristics. In Shan-tung and Pe-tchi-li we shall find new subjects to engage our attention.

The general characteristics, then, of the province of Chekiang are the great attention paid to the cultivation of the dwarf mulberry-tree; the vast quantities of silk, both plain and bordered with gold or silver, exported; the beauty of its fruit and flowers; the abundance of bamboos growing about its rivers (not only used by the Chinese workmen in making mats, boxes, combs, water-pipes, and telescopes, but also by physicians who distil from them, by the action of fire, a certain water which they consider valuable for medicinal purposes), and the fine flavour of its mushrooms, which are salted, dried, and sent as great dainties to all parts of the empire,—steeped in water for some time, they seem to recover all their pristine freshness, and are eaten with great gusto by the Chinese gourmands. Hams, too, are among its exports; and fish of all kinds, but especially lobsters, are plentiful.

THE LAMA CARAVAN.

A considerable number of lamas are kept at Tacna, a town of Bolivia, at some distance to the east of Arica, the principal port of that republic. As the Indians make use of them for beasts of burthen, they serve them instead of the camel. It is an interesting sight to see a caravan train of a hundred or two of these sociable creatures pacing along in stately order with their intelligent heads raised above their long necks. A lama without any load on his back marches in advance as leader, a large particoloured bunch of feathers decorating his head, and bells and ornaments dangling from his neck. Each of these useful animals generally carries a load of fifty pounds weight; and the usual merchandise they transport is block-tin, sent down from the eastern side of the Cordilleras. The lama is easily tamed, and becomes as attached to his owner as a dog. When he is to receive his load, he kneels down, like the camel; but if he feels the load to be too heavy for him, he refuses to rise, and utters a deep moan. He is a perfect model of gentleness, and if kindly treated, ready to do any reasonable service required of him; his only means of defence is discharging a mouthful of spittle at any beast or human being that seeks to injure him. Other animals of the lama species, such as the paco, carnero, guanaco, and vicugna, which have kinship also with the sheep and goat, are used for the same purposes. Their food consists of the ichu, a sort of rush, which is found on cold elevated spots fourteen thousand feet above the level of the sea.

The patient good-tempered Indian is as temperate a liver as his lama, and on his journey with the caravans eats little else but the coca-leaf, which he chews, and will serve him on a push, both for meat and drink, four days long. This leaf has another singular property—it keeps off sleep and wearisomeness, without injuring the health. It is of a bright green, like the orange-leaf, and grows on a low tree, from which it is gathered twice in the year; it is then dried in the shade, and a quantity is done up in packets, which are preserved in baskets. A store of these packets, together with a bottle of citron juice, or some molle (the ashes of the Peruvian mastix-tree), form the Indian's provender when he starts upon a journey. Although coca-chewing is proof with him against hunger and thirst, as we have already remarked, he never misses the opportunity, when it is set before him, of making not merely an immoderate, but an incredibly enormous meal.

The Indians appear to be regardless of the nature of the spot where they halt with their caravans in the evening; the quarters for the night seem taken up as chance may dictate: it is not necessary that they should be within an enclosure; but they are no way discontented to abide upon a snowy acclivity near a mountain promontory, between a fissure in a rock, or under a pendant cliff. The roll their ponchon, or mantle, round them, lay themselves quietly down to sleep on the bare ground, and awake as much refreshed and renovated as if they had risen from a bed of down.

There cannot be a more disgusting sight on your journey through the sandy wildernesses of this country than the scattered bones and skeletons of the beasts used for the caravans, among which are numbers of mules and asses. If they fall sick or break down, their loads are transferred to the backs of some of the supernumerary animals, and they are left behind to their fate. The poor creatures, as soon as they begin to recover, exert what little strength they can muster, and struggle to find out some trace of the route that leads to an inhabited spot. The majority of them, however, fall a prey to the vulture or condor, which has an eye of such marvellous keenness, that they can discover this spoil from the snow-clad peak of the Cordilleras. The bird wings his flight down upon his victim with the swiftness of lightning, alights on his head, picks out both his eyes with his beak, gores his body open, and gives so unbridled a rein to his gluttonous appetite, that he is scarcely able to move from the spot after he has had his full; in this state he is frequently overtaken by the Indians, who speedily dispatch him with their poles. If the spoil be not too unwieldy, the condor seizes hold upon it with his claws, and bears it away to his nest on the peak of a mountain. The largest bird of this species is the Morro-morro; his body is covered with a splendid sable plumage, and behind his neck he has a dark-grey ruff four inches in breadth. The outer edge of the feathers of his wings is of the same grey, so that when he is sitting and seen from behind, he appears to wear a mantle.—*Ritter's MS. Notes.*

Motives to Migration in Birds.—The passage to our shores is a long and a dangerous one, and some imperative motive for it must exist; and until facts manifest the reason, we may, perhaps, without injury to the cause of research, conjecture for what objects these perilous transits are made. We know that all young creatures require particularly compounded nutriment during their infant state; and nature, as far as we are acquainted with it, has made in every instance provision for a supply of fitting aliment. In many instances where the removal of station could not be conveniently accomplished, instinct has been given the parent to provide the fitting aliment for its new-born young. Thus insects, in some cases, store their cells with food ready for the animation of their progeny; in others, place their eggs in such situations as will afford it when they are hatched. The mammalia, at least the quadrupeds belonging to this class, which could least conveniently move their station, have supplies given them of a milky secretion for this purpose. Birds have nothing of this nature, and make no provision for their young; but they, of all creatures except fishes, can seek what may be required in distant stations with most facility. A sufficiency of food for the adult parent may be found in every climate, yet the aliment necessary for its offspring may not. Countries, and even counties, produce insects that differ, if not in species, at least in numbers; and many young birds we cannot succeed in rearing, or do it very partially, by reason of our ignorance of the requisite food. Every one who has made the attempt well knows the variety of expedients he has resorted to, of boiled meats, bruised seeds, hard eggs, boiled rice, and twenty other substances that nature never presents, in order to find a diet that will nourish them; but Mr. Montagu's failure in being able to raise the young of the cirl-bunting, until he discovered that they required grasshoppers, is a sufficient instance of the manifest necessity there is for a peculiar food in one period of the life of birds, and renders it probable that to obtain a certain aliment this willow-wren and others of the insect-eating and fruit-feeding birds direct their flight to distant regions, and is the principal cause of their migrations.—*Journal of a Naturalist.*

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BRITISH AGRICULTURE.

AUGUST

[Agricultural Emblems of August.—From Illuminations in MS. Saxon Calendars in Brit. Mus.]

In warm and dry seasons it frequently happens that this is the hottest month of the year. Not, however, that the sun's rays continue to possess the same power that they did a month or six weeks ago; but when once the ground has become heated and parched, and the whole surrounding medium has attained a high temperature from a continuance of warm weather, a less degree of intensity under such circumstances is sufficient to make the state of the atmosphere oppressive to the feelings. The nights, however, particularly towards the latter part of the month, begin to lose their summer sultriness; while we often find the pastures have become so parched, and the foliage so dried and shrivelled, that a premature decay of nature seems rapidly approaching; so that by the end of the month the bloom of summer may be said to have departed from the land. But the autumnal rains may be expected soon to set in, when, should the state of the atmosphere be favourable to vegetation, the late parched meadows and pastures will again assume a freshness and lively green, almost equalling the appearance of spring; but the leafy groves and hedgerows never regain their original verdure and beauty, although the ripening fruit in the orchards and gardens presents a pleasing and an enticing aspect, an aspect which many persons, no doubt, greatly prefer to the lovely blossoms of promise of April and May.

Should the previous portion of the season have been a favourable one for vegetation, this month is the great maturer of the summer crops; for though some of the later ones, particularly in bleak and elevated situations, may, when the month closes, be still unfit for gathering in,—by this advanced period of the season the hopes or the fears of the husbandman begin to be proved and realised. The crops of hay, excepting in particular localities, and under extraordinary circumstances, will have been stowed away in the stack or the mow; and, taking the seasons in general, the corn-harvest will everywhere be drawing towards a conclusion, except in those late situations already alluded to. However, since climate, nature, and quality of the soil, situation, early or late sowing, and the character of the weather during the past months, must all be taken into the account in reference to early or late harvests; and since those are found differing so materially between one section of the country and another, it will consequently be the less surprising that the sickle may frequently be seen in operation by him who travels through the various and varying sections of this island, in all the four months of July, August, September, and October. Generally, however, it may be observed, unless the seasons should be peculiarly unfavourable, much of this very great difference we have noticed in the maturing of the corn-crops proceeds from bad

management, and ought not to be altogether attributed to the causes we have mentioned.

In many parts of the country we find an old custom still prevailing, and for which the farmers cannot plead any absolute necessity, we mean that of engaging in both haymaking and reaping at the same time. When this is the case, it is very evident that one or the other must be neglected; for where matters that demand such a general and constant attention are permitted to interfere and clash with each other, there will, as a natural consequence, be neglect or mismanagement somewhere. In most instances this practice will be found obtaining in those parts where but little corn comparatively was formerly cultivated, so that the corn-harvest could hardly be considered worthy of having any distinct and regular period set apart for it; and when circumstances have arisen which have induced the farmers to alter their system, and to effect a change in their agricultural products,—for some reason or another, or perhaps for no reason at all (for it is no uncommon thing to find persons belonging to this class of the community acting apparently without any reason whatever), they continue to cultivate their land in such a way as to render it doubtful whether the grain or the grass crops ought to take precedence at harvest-time. When but small patches of corn were cultivated in districts where the land was principally devoted to grass, it was customary for the haymakers to devote an hour or two in the mornings to reaping, not meddling with the hay until the dews of the previous night had been exhaled by the sun's influence; and they would return in the evening to bind up and shock the grain that had been cut in the morning. Even at the present day we find, upon many farms that are of what may be termed a mixed cultivation, this old and certainly very indifferent system of farming still prevailing, notwithstanding the endeavours that have been made to amend it.

As we remarked of July, respecting its being the principal month for haymaking, so we may remark of this month as regards the corn-harvest: and hence we will introduce into our present article the observations which we purpose making upon so interesting an agricultural subject; and we cannot commence them more appropriately than by inserting our old friend Tusser's excellent advice:—

> "Make sure of reapers, get harvest in hand,
> The corn that is ripe doth but shed as it stand;
> Be thankful to God for his benefits sent,
> And willing to save it with earnest intent."

Again—

> "Reap well, scatter not, gather clean what is shorn,
> Bind fast, shock apace, have an eye to thy corn;
> Load safe, carry home, follow time being fair,
> Cove just in the barn, it is out of despair."*

The scythe and the sickle are the only implements employed in reaping; but these, according to prevailing customs, and the views and opinions of practical agriculturists, are of various forms and patterns. The sickle, for instance, is sometimes but slightly curved; at other times long and very considerably bent, particularly the part adjoining the handle: and on other occasions we find sickles very short as well as crooked. The edge of this implement is indented or cut into teeth, something like a fine saw; but there is this difference, since on the upper or smooth surface (as the sickle is held in the reaper's right hand) the teeth come to a keen edge, but, owing to the indentations or teeth, the edge is so rough that it does not readily let go whatever it once embraces. But there is another species of sickle, usually called a hook, which has a broader blade than the toothed sickle, being without any teeth whatever. Hooks are never of a great length, for if they were, their weight would endanger the spraining of the wrist; they are by no means so generally used as the other sort of sickle. However, where the crops of winter grain are very stout and heavy, persons accustomed to use them can not only perform more work than with the toothed sickle, but execute it in a better manner. As regards the fitting up of the scythe, which is now commonly used for mowing grain, particularly oats and barley, and in many places the wheat-crops too where they are not heavy, there are several plans occasionally adopted. In every instance, however, the scythe is furnished with some sort of light frame-work, attached to the hinder part of the scythe and the lower part of the handle, for the purpose of laying the grain straight in the swath, and the ears all one way; so that where raking and binding are necessary, the sheaves may be formed as smoothly and compactly as if the corn had been cut with the hook or sickle. Sometimes the frame consists of three, four, or five 'fingers,' or narrow strips of wood, somewhat shorter than the scythe, and curving in a similar way, fastened together by small cross-pieces, and firmly secured to the blade of the scythe. The general name for an implement of this sort is a *cradle*. The fingers are not always equally long, nor of the same shape; but always intended to answer the same purpose. The *bow* is another of those appendages to the scythe; but it is better adapted for carrying the cut stalks to the swath than for placing them with their heads all in one direction. The name sufficiently explains the nature of this appendage; one end of a bent piece of flexible timber being fixed in a hole in the hind part of the scythe, and the other in a corresponding part of the handle. Occasionally the bow is covered with a piece of canvas or linen cloth, which has the effect of preventing the straggling ears that may have been cut off short from falling through among the stubble, and so becoming lost. Other inventions have been tried, but the cradle and the bow we now find generally adopted. There are also two different plans of mowing corn; the more general, however, is to proceed the same way as is customary with grass, the mower keeping the standing corn on his right hand; whereas we sometimes find the farmers adopting the plan of mowing up against the standing crop, particularly their wheat; but in this case it is necessary that a raker and binder should immediately follow the mower for the purpose of removing the swath; for until that is removed, another swath cannot be mown. With respect to barley, in most of the districts where this species of grain is chiefly grown it is neither bound into sheaves nor shocked, and hence there is no particular necessity for laying it all straight and regular in the swaths; for when it is sufficiently dry and withered, when the large drag-rake passes over the stubble, and no gleaning takes place, it is raked together and carted to the stack or mow. Should the weather be hot, and the awns or beard of the barley brittle, dry, and prickly, the carting and stacking of barley is considered among the most unpleasant operations that fall to the lot of the farm-labourer. Should the weather prove rainy, the barley-crop requires considerable care and attention after it has been cut; for without the swaths are frequently turned over, it is very apt to sprout and germinate, by which means it is rendered unfit for malting. In mowing oats, particularly the heavier and finer sorts, should they remain uncut a little too long, great care is necessary to prevent a considerable loss, since, under such circumstances, they shed very freely. In certain parts of the country where the soil is adapted for raising oats, the necessity for immediate reaping when once the crops have attained a certain ripeness is so pressing, that the farmers are often induced to submit to exceedingly high wages rather than run the risk of their crops being exposed to winds and storms; for were these to happen while the oats are ripe and standing uncut, the waste by shedding would be incalculable. In some of those districts we particularly have reference to, the practice of Sunday-hiring is yet in vogue,

* 'August's Husbandry.'

The reapers flock to those places from a distance, where they are hired by the week, and four or five shillings a day, with board and lodging, and sometimes six or seven shillings, is the rate of wages which the farmers often submit to. But if such wages appear exceedingly high, the labour is proportionably severe; for the reapers are called abroad as soon as the light is sufficient for them to perform their labour; nor do they quit the field till night is fast approaching, sixteen or seventeen hours being ordinarily employed in a day's labour. Breakfast is usually brought to the field; and unless the farm-house should happen to be at a convenient distance, dinner is brought out also; when the men are only allowed just sufficient time to eat their messes of victuals before the farmer's headman or foreman, whose place it is to lead the field, sets off again to his reaping, when the rest of the party are expected to follow. There is usually a barrel of ale taken to the field for the use of the reapers whenever they feel inclined to have a draught, or rather whenever they can spare time to slake their thirst; but unless a man is particularly expert with his sickle, he will hardly find time, during the hours of business, to pay a single visit to the beverage he so much stands in need of. A short explanation here appears necessary, for this is very unlike the practice which commonly prevails in the harvest-field. The lands or ridges are all exactly of the same size, so that each individual has precisely the same quantity of work to perform; and the master usually sees that the work is done properly. The leader of the field (who is invariably an excellent reaper) sets himself to work on the first ridge, the rest of the party falling in as it may happen, but each has his own ridge to reap, and the same amount of labour to perform. Such of them therefore as are competent to keep pace with the leader will find opportunities of occasionally quenching their thirst, or whenever the leader chooses to do so, and perhaps at other times; but as he no sooner gets to the end of one ridge than he returns and begins another, while he and the more expert reapers are refreshing themselves with a draught of ale, the less expert reapers are toiling to finish their task, and when they return to the place of beginning they find the leader already advancing with his new ridge, and without losing time by seeking a draught of beer, they find themselves already behindhand with their appointed day's labour. Thus it is that those who are the most dexterous at the business find time to enjoy whatever may have been provided for them; while those who from greater exertion stand more in need of that stimulating vigour which wholesome home-brewed is considered to impart, are the very individuals that have the fewest opportunities. Some of the western parts of Lancashire and Cumberland, bordering upon the Irish Sea, are among those districts where large quantities of the best oats are grown, and in Furness, which is of no great extent, scarcely a harvest passes without some of the reapers falling victims to this inhuman system of overworking.

When rye was pretty generally cultivated, it used to be among the first of the grain crops ready for the sickle; whereas at present the wheat crops, in many situations, are cut earliest, though in other places barley takes precedence. In those divisions of the country where most of the farms are purely arable, the population is often found inadequate to the task of performing the labour required in the harvest season; hence the farmers are in some degree dependent upon aid from a distance. This being the case, it is customary for many of the young men—small farmers' sons, labourers, and some few mechanics who may understand reaping—to repair to those parts from the dale districts and grazing countries, often travelling sixty or eighty miles to seek a few weeks' employment, returning home again after an absence of five or six weeks with a greater amount of wages than they probably could have earned in double the time in their own neighbourhoods. However, for the last twenty years or more, this custom has been decreasing in almost every part of the country, which, in a great measure, may be attributed to the introduction of steam; not that the reaping is performed by any curious steam-machinery, but in consequence of the easy steam-boat communication between this country and Ireland; so that at the present time there scarcely is a corner of the country that yields much corn, whither we do not find numbers of Irish labourers flocking at the season. Subsisting poorly and inexpensively in their own country, the English farmers find that they can maintain them in an inferior manner here, and consequently at a cheaper rate than they could our English labourers; and when once they have wandered into the interior of the country, they must either work or starve, so that the farmers find but little difficulty in arranging with them for a low rate of wages.

The great influx of labour from Ireland has, among other things, very much tended to prevent females taking the part they were formerly wont to do in many places in the labours of the harvest-field; for, although not perhaps in an equal degree to haymaking, the maid-servants, as well as the wives and daughters of the small farmers, were accustomed to assist in the field during the corn-harvest. But the occupation of women in the harvest-field is now gone; and when we happen to see them at all in the wheat-field, it is only after the shocks of corn have been carted away; for seldom until then are they now permitted to accompany their children to glean up a few scattered ears which may still remain upon the ground, and this is often not allowed until the large rake has been dragged over the stubble: there are, however, still a few districts where men and women indiscriminately attend every morning at some market-cross or other accustomed place, with their hooks or sickles, for the purpose of hiring for the day, and whither the farmers repair from the surrounding neighbourhood for the purpose of engaging as many as the extent and condition of their crops may seem to require. But this is an ancient and unprofitable mode of managing matters, for as eight o'clock is the usual hour of leaving the place of hiring, and the party perhaps having two or three miles to go to their labour—and as they make a point of quitting work precisely at five in the afternoon—it is evident that a great deal of time is uselessly lost; so that the farmers have to abridge the rate of wages they otherwise might afford to give, and hence the loss ultimately falls upon the labourer. A few of these farmers still allow the children to accompany their mothers, and glean after them among the sheaves; but the temptation to drop ears intentionally to be picked up by the gleaners is so great, that the custom is now but little tolerated.

Where it is the custom to let out the reaping by the acre, as is now the case in several parts of the country—not to strangers, however, but to parties connected with the neighbourhood where the work has to be performed—we still frequently find the women assisting their husbands both in the reaping and the binding. Tusser, in his advice upon 'Harvesting Matters,' recommends letting out the reaping 'by great,' rather than hiring people by the day—

> "To let out thy harvest, by great, or by day,
> Let this by experience lead thee the way:
> By day will deceive thee, with lingering it out;
> By great will dispatch, and put all out of doubt."

When the season of the year is considered in which the reaping is generally performed, the weather frequently being hot and sultry, and also the posture in which the reaper's body is almost constantly placed, the back being bent to a horizontal position, when closely followed during a long day, it is as severe labour as almost ever falls to the lot of the husbandman. Hence it is that the custom generally prevails of providing the reapers with beer, of a good or middling quality, where it is not usual to sup-

ply any at other seasons. Even with many of those who take reaping by 'the great,' and who are not themselves in a condition to brew their harvest-drink, it usually is part of the agreement that the labourer is to receive so much money per acre, with a stipulated allowance of malt liquor or cider. Where the grain is all standing and straight, and not a heavy crop, a first-rate reaper will cut half an acre per day; but it is accounted tolerably good work for a man to cut, bind, and shock one-third of an acre for a day's work. But a good mower will cut two acres and a half or three acres of a middling crop of oats or barley; but of course he is not expected to either rake or bind it, two other persons being employed to complete these operations.

In seasons when the weather proves favourable, there is not much trouble in getting the grain-crops ready for the stack after they have been cut; for unless the straw should not be quite ripe, or there should happen to be much weeds or grass amongst it, but a short period is required before it is in a condition to be stacked; but in a wet harvest, wheat and barley in particular are apt to sustain serious injuries; for when the rains are accompanied by a pretty high degree of temperature, in a very few days the grain begins to germinate and grow, whereby its quality becomes materially deteriorated, for sprouted barley is entirely unfit for malt; while sprouted wheat, commonly called unsound, is not at all fit for bread,—indeed, unless it be mixed with grain of a superior quality, it is impossible to manufacture it into the ordinary wheaten loaf.

A managing and tidy practical farmer may commonly be known by the neatness and symmetry of his corn-stacks after they are thatched, and the general order and cleanliness of his barn-yard. Among Tusser's notices of good harvest points is that of 'goving,' or making a mow—

> "Gove just in the barn, it is out of despair."*

As there are different modes of making or curing hay in different parts of the country, so are there various plans adopted in managing crops of corn after they are cut or reaped. In some places we find the farmers adopting different sorts of treatment towards the different kinds of grain, and elsewhere we find the different kinds of grain all treated in precisely the same way. For instance—wheat is usually reaped, bound, and set up in shock or stook on the same day, provided it has been shorn tolerably dry; and in a few days or a week afterwards, provided it has been pretty free from weeds, and fully ripe when cut, and the weather tolerably favourable, it will be ready to be carted home and stacked. Whereas the same farmers will mow their barley, but neither bind nor shock it; but when it is sufficiently dry, will cart it to the mow or stack in a similar manner to hay. As for crops of oats, we sometimes find them treated the same way as wheat, and sometimes after the barley fashion.

> "The mowing of barley, if barley do stand,
> Is cheapest and best for to rid out of hand;
> Some mow it, and rake it, and set it on cocks,
> Some mow it, and bind it, and set it on shocks."*

Where but small quantities of grain are grown, it is customary to use only the sickle, and to shock the different sorts in precisely the same manner. Again, in some places the farmers cut the straw near the ground at the time of reaping; but in most of the best districts for growing wheat, where the straw is usually tall and stout, it is the custom to reap it pretty high, an advantage to the reaper and the thresher afterwards, the sheaves being lighter and better to handle; and the stubble, or haulm, is afterwards mown and raked together at some leisure period, and carted to a convenient place, where it may be used in littering the farm-stock, or converted into manure in some other way. Leaving much stubble on the ground is a decided sign of bad management; for after being exposed for a considerable time to the action of the atmosphere, it loses the greater portion of those qualities it ought to possess in order to improve future crops.

* 'August's Husbandry.'

In speaking of the ploughman's feasts and holidays in a previous article, we had occasion to refer to the harvest-home, as being one of the few remaining occasions that annually return to gladden the hearts of those who have toiled through the long and varied year, busied with the duties and cares of the husbandman—some of them severe and laborious; and we there remarked that in many parts of the country this is now the only occurrence when the farm-labourers are regaled in the custom of olden times during the four seasons, by those who usually employ them.

> "Once ended thy harvest, let none be beguiled,
> Please such as did help thee—man, woman, and child;
> Thus doing, with alway, such help as they can,
> Thou winnest the praise of the labouring man."*

But at the harvest-home supper, to which all are invited who in any way may have assisted in securing the crops, besides the abundance of boiled and roasted, and plenty of merry brown beer, with the more insidious punch-bowl on many occasions, there is generally the village Orpheus with his rustic violin, ready to strike up some jocund air, when the whole party join in the rural country-dance; and thus, once a-year, amidst eating, drinking, dancing, and merry-making, the hardships and toils attendant on a life of labour, as well as the difference of rank and station, are for a time laid aside, and apparently forgotten.

During the time that the corn-harvest is progressing, for a short period nearly every other sort of farm labour is laid aside; but should the weather prove unsettled and changeable, the late-planted potato-crops, and the turnip-crops generally, demand the husbandman's attention; and the last ploughing and hand-hoeing is commonly bestowed upon them not later than during the present month. But in the grazing and grass districts, during the haymaking season, which often extends into August, the farmers frequently experience a difficulty in finding employment for their hired people; indeed it is no uncommon thing to see them with literally nothing to do.

To such an extent has the consumption of corn increased in this country within the last century, that notwithstanding the numerous and great improvements that have been introduced into our agricultural system, in addition to the breaking-up of thousands of acres of ground that had never before been stirred, yet the increase of our population has gone beyond the increased growth of corn so very far, that we have had of late years to import annually large quantities of corn from foreign countries, whereas we used to be regular exporters of it ourselves; and if we may be permitted to draw conclusions from the past, although there still remain vast tracts of land in this kingdom in an unproductive state, it scarcely seems probable that the produce of grain will ever again exceed the home consumption. It may be true that the great increase of population has necessarily called for an increase of various other farm productions, such as cannot be conveniently imported, particularly animal food; hence there is an almost insuperable objection against subjecting a greater number of acres to the plough than is at present in an arable state.

This fact may lead us to compare the nature of present crops with those that were formerly cultivated, not generally, perhaps, but to some considerable extent in particular parts of the country, several of which have been nearly, if not entirely, superseded by such crops as are better suited to the soil, or that may now be turned to a more profitable account. Among the crops that were formerly cultivated in England, but which have for many

* 'August's Husbandry.'

years past wholly or nearly ceased being so, we will mention madder, saffron, weld, woad, buckwheat (which has been spoken of in a previous article), and a few others. We do not intend to devote much space to our remarks on the cultivation, &c. of any of these crops; but without including them in our compendium of British agriculture, it might appear to be incomplete.

Madder, which is a plant of Eastern origin, and not indigenous to this or any of the adjacent continental states, became an interesting subject about the middle of the last century with many of our leading agriculturists; but as it was only cultivated to be used in dyeing, there was little likelihood of its becoming a generally cultivated crop: but the raising of madder-crops, like some others that require a great deal of labour and attention, and a peculiar soil and management, is the better adapted to those countries where labour is cheap, and where the soil and climate are more congenial to its growth. When madder is cultivated, it is mostly for the sake of its roots, which are used in dyeing, though the stalks have sometimes been given to cattle; and when eaten by milch-cows, the milk they yield becomes of a deeper orange-colour, and the butter exceedingly yellow, but at the same time well tasted. On some parts of the Continent they cut the stalks and dry them for hay; but as it is desirable that the seed (of which there is but very little) should be permitted to ripen, the summer is far advanced before the plants are fit for cutting. But one of the great objections with the generality of farmers to cultivating crops of this sort, is that of their requiring so long a period, nearly three years, to bring the roots to a fit condition to be taken out of the ground, dried, and sold to the dyers; for where three years' rents have to be paid, as well as the amount of wages for so long a period for all the labour and attendance the crop necessarily requires, the value of the crop must be great indeed to induce parties to speculate to any considerable extent in its cultivation. One of the chief reasons, no doubt, for its becoming less cultivated than it formerly was, is the great increase of our commercial intercourse with foreign nations, and hence the opportunity of importing various other ingredients made use of in dyeing; and although none of them may have altogether superseded the use of madder, yet they have tended to lessen the demand. A writer in the 'Farming Dictionary' makes use of the following remarks:—"For the madder to succeed well, there should be a great depth of good soil, and it should be turned up very deep with the plough, or, what is much to be preferred, with a spade. Madder is very fond of moisture, and therefore thrives best on a good loam with a clay bottom. To bring it to a state of perfection, it requires a great deal of nourishment; and yet it does not impoverish the land, which is evident from the circumstance that when the madder has been dug up, the ground in general is in excellent condition to bear a good crop of wheat. The root, which is one of the best ingredients that can be used for dyeing woods and stuffs, imparts to them a red colour; not very bright, it is true, but one which resists, without alteration, the influence of the air, the heat of the sun, and the effects of those ingredients made use of to test colours. It contributes also towards making other fixed colours lasting; and a method has been discovered of giving to cotton a very pleasing and lasting colour with it. But all parts of the root do not yield this valuable red; for the dye of some parts is fainter, and soon fades; while other parts are worth nothing at all."

After the roots, which strike deep into the ground, are taken up, washed, cleaned, and dried in kilns built for that purpose, they are then ground into a powder, in order that the whole of the dye may be readily extracted. But the green roots will yield a considerable quantity of dye if they are bruised immediately on their being taken out of the ground; so that when persons engaged in dyeing grow their own madder, much labour and delay are sometimes avoided by using it in a green and undried state. In Holland and France considerable quantities of madder continue to be cultivated; but very little at present in any of the southern counties of England, where many of the farmers formerly turned their attention to its cultivation.

Though the cultivation of saffron never extended beyond certain local districts, at least to any great extent, at one period the demand for it was such, that the farmers of a few districts devoted much of their time and attention to its culture. About a century ago, nearly the whole of the country around Saffron Walden in Essex, and thence northwards into Cambridgeshire, was devoted to the cultivation of saffron; but at the present day, the quantity grown in either of those counties is but very trifling indeed. Hares are remarkably fond of the young plants, so that if considerable care is not paid to keeping them out of saffron-grounds, the crops are in danger of receiving much damage. Saffron crops are usually allowed to remain in the ground three years, at the expiration of which the roots are carefully taken up and planted in some new situation.

Weld, or dyer's weed, is a plant that grows wild in many parts of the country. We also sometimes find it cultivated; but it never has been so to any great extent in this country, and at present we may travel through many entire counties without ever falling in with a single acre of it. This also is one of those plants which was formerly used pretty extensively in dyeing; but which, through our extended commercial intercourse with various parts of the world—and hence the means we enjoy of procuring substitutes of a superior quality and at a cheaper rate—has fallen greatly into disuse amongst us. When cultivated in a good soil, it grows to the height of three feet, and is then considered as yielding a superior dye to that which grows wild. The best time for sowing it is in the latter part of July or the beginning of the present month, and it remains in the ground until it has done blossoming the following summer, when it is pulled up by the roots, dried, and sold to the dyers. The whole of the plant is used in dyeing; but the berries, which contain the seed, are understood as yielding the greatest quantity of dye. The blossoms are yellow, and the whole plant is used in dyeing that colour. In France, where it is still cultivated pretty extensively, they sow it among beans or other crops; and as soon as these are harvested, they immediately set about weeding the ground, so as to leave the young plants of weld in full possession of the soil. Mr. Miller says:—"The beginning or middle of August is the proper season for sowing weld in this country The only care which it requires while growing is to keep it clear of weeds that might choke it, or at least weaken its growth."

Woad is the common name of another of those plants formerly used somewhat extensively in dyeing, and, on that account, cultivated in some parts of this country, for then it was considered an almost essential ingredient in producing the various shades of blue; but the introduction of indigo has nearly superseded the uses of this (once) valuable plant. The leaves of this plant are used in dyeing after they have undergone the process of bruising or grinding, and are then formed into cakes and dried, having first been reduced to the consistency of a paste, so that they may be easily moulded. Upon a rich soil, and in favourable seasons, which should be neither cold nor yet dry, woad commonly yields two crops; and in the more genial climate of southern Europe, sometimes three or four. An acre of land well husbanded will yield a ton of woad, or something more; but the last crop is very inferior in quality to the first one, and ought not to be mixed with it. When it is intended to bear seed, the leaves of the plants should not be closely stripped off; but one crop, or gathering of the leaves, may be had even from those plants that are intended to bear seed.

Before the sprit of commercial enterprise had extended our trading transactions to almost every part of the globe, it was considered a matter worthy the attention of the farming interest to devote a portion of their farms, where the soil and situation appeared favourable, to the cultivation of those articles our home manufacture might require; and according to the extent of business then exeeuted, from an imperfect aequaintanee with their ehemieal properties, there is little doubt but a far greater quantity of dyeing ingredients was made use of than at present is the ease. In those days it was customary for most families to spin and manufaeture a portion of their own elothing, so that every family was in the habit of using more or less of dye-stuffs. The dye-woods and other materials used in dyeing are mostly imported from countries where they can be proeured cheap; and it may be remarked that hot climates eommonly yield those ingredients which impart the richest and deepest dyes.

In many parts of the eountry peas and beans are cultivated to so great an extent, that with the farmers these crops are eonsidered bnt little inferior to any other in point of importanee; and among the regular systems and rotations of erops, they oceupy as prominent a plaee as almost any other. The erops of peas are early ready for being gathered in; but the bean crops are commonly the latest we find abroad in the harvest-field.

> "No turning of peason till carriage ye make,
> Nor turn it no more than ye mind for to take
> Lest beaten with showers, so turned to dry,
> By turning and tossing, they shed as they lie."*

When the erop of peas is suffered to beeome very ripe on the ground before it is cut with the seythe or the siekle, the peas are very apt to shed if exposed to either rain or dews; but unless the crop is a very light one, they have either to be colleeted into heaps some time before they are earted home, so that the straw should become thoroughly withered, or else more than a single turning will be found necessary.

> "Stack pease upon hovell abroad in the yard,
> To cover it quickly let owner regard;
> Lest dove and the cadow there finding a smack,
> With ill stormy weather do perish thy stack."*

It is somewhat singular that the old and curious custom here referred to of stacking peas upon some "hovell," that is, upon some hog-pen, or other low and mean outbuilding, is still praetised in many plaees, without, in many instances, the parties thus adopting it being able to assign any partieular reason for their doing so, further than its being an old and eommon custom. Where but a small quantity is cultivated, we have frequently seen them stacked in some old forked tree, when sueh a one happened to be in the vieinity of the farm-yard. There can be no doubt but peas ought to be kept dry after they are staeked, and consequently an airy situation is deeidedly the best; but the principal reason for placing them in such peculiar situations seems to be a desire to proteet them against the depredations of hogs, poultry, &c., which would not be the ease were they stacked like grain; for when the upper part is well seeured with thateh, by their being placed in an elevated position, there is not mueh chance of any serious damage happening to them in the way just mentioned. But with regard to nearly all sorts of crops that have to be subjected to the flail, it is invariably a consideration that they be not diffieult to thrash. Hence some crops besides peas, when plaeed in situations where the straw 'gives,' or becomes soft and damp, require a great deal more labour in separating the grain from the straw. Thus, for instance, should barley be eut rather early, and staeked before it be thoroughly dry, though it may have had but little of either rain or dew upon it; yet should it be thrashed out during damp or rainy weather, it will be difficult to get the straw elean, or the awns or beards separated from the grains of eorn. When farmers were more slovenly and eareless in the eultivation of the eorn crops, and the various kinds of weeds were eommonly abounding in the eorn-field a great deal more than we find them at present, the grass and weeds usually found mixed with the straw in the sheaves had the effeet of imparting a moisture or mouldiness to the erops, so as to render the thrashing a more laborious operation than it eommonly is at present.

But as regards both peas and beans, there is no doubt but they are improved by a moderate heating in the mow, sinee it has the effect of hardening them, and rendering them in a better eondition for the market: but in all crops eare must be taken that they do not beeome too much heated, that is, mow-burned. Crops of beans and peas are generally considered a sign of good farming, but they require different sorts of soil in order to yield productive crops. Beans are mostly cultivated upon stiff elayey soils; while loamy and even light lands will produee tolerable crops of peas. It therefore happens that in those districts the most celebrated for turnips, we find but few beans eultivated, from the two erops requiring very different qualities of soil to thrive upon. Beans are usually allowed to stand until both the stalks and pods beeome blaek. They are then eut—sometimes with a seythe, but more frequently with a sickle, tied up in small bundles, whieh are plaeed upright and singly; and as the straw is of no value, and the beans themselves not easily injured, they are suffered to remain until two or three dry days happen in succession, when they are carted to the homestead, and stacked.

At one period it had become very mueh the fashion to sow or plant turnips or eabbages with crops of beans, but notwithstanding this plan was often found very advantageous to the farmer, it has now, except in a few loeal districts, been pretty mueh laid aside. The plan usually adopted was this:—two rows of beans were sown, either drilled or ploughed under, at fifteen or eighteen inches apart, leaving a spaee of three feet or three feet and a half between these two rows and the next two. If eabbages were planted in the intermediate spaees, one row would be sufficient to fill it; but if turnips were preferred to fill up these spaees, then two rows might be introduced. Sinee beans were not considered a certain and never-failing erop, this plan undoubtedly gave the parties two strings to their bow; for if the beans did not succeed or bear well, whieh, however, they were more likely to do than when the whole space was oeeupied with them, then there were the turnips or cabbages, which but seldom failed. Land has frequently been known to produce from two to three quarters of beans per acre when planted in this way, and considerably over half a crop of turnips or eabbages; making together a more valuable erop than a full crop of either the one or the other would have yielded. It may be true that a little more labour might be requisite, but it should ever be borne in mind that a very small additional quantity of any valuable crop will well repay the expense of a eonsiderable amount of extra labour. This, though apparently so self-evident a matter among farmers, is by no means generally aeted upon; a single example will be suffieient to elueidate the principle we have here laid down. Even now, while we are engaged in writing, the second field whieh our study looks out upon is at present oeeupied with wheat yellow for the sickle. We have had daily opportunities of observing its growth and progress, as well as the labour and attention that have been bestowed upon it. Though this field it at present in the occupation of a large farmer, one who professes to manage his own affairs, and who has been brought up to the business of farming; yet a ramble aeross the foot-path which intersects the field in question will be sufficient to convince any one at all acquainted with agricultural affairs that there has been bad manage-

* Tusser's 'August's Husbandry.'

ment somewhere. The state of the matter is this—the seed was put in when the ground was in but bad condition last autumn; not that the soil is naturally poor, or that there had been any deficiency of manure, but evidently there had been a neglect in destroying several sorts of weeds that did not fail to show themselves early in spring. These weeds, as well as other annual ones that sprung up as the spring advanced, were permitted to encroach upon the young wheat-plants until late in May, when three or four labourers with their hoes were sent to set about weeding it. Although the whole field was full of weeds and filth, one section of it then appeared something worse than the other; and upon this part they first commenced. In our walks we remarked the progress of the party employed in weeding; and so full of various sorts of trash was the crop, that they did not complete but little over half an acre per day. In this way they progressed until they had cleaned about half the field; when the artificial grasses, becoming fit to cut, they were taken away to that or some other job of work, so that the opportunity passed away, and the remainder of the wheat-crop was suffered to fight its own battle with a host of weeds. The consequences are just what the owner or any other farmer might have expected: the half of the field which was weeded will yield twenty-six or twenty-eight bushels to the acre; the other, or unweeded part, will not yield over fourteen or sixteen. Now, here is a difference of twelve bushels per acre, which, at the present price of wheat, would be worth about 5*l.*; whereas the cost of weeding was not over 12*s.* the acre, leaving a clear difference (loss to the farmer) of 4*l.* 8*s.* per acre! It may be true that the cleaner portion may require a little more thrashing, &c., yet this is doubtful, for weeds in corn have the effect of imparting a moistness to the straw that renders it more difficult to separate the grain from the chaff; hence the twenty-eight bushels will probably be thrashed with as little labour as the sixteen. Then there is a material difference in the quantity and value of the straw in favour of the weeded part, so that at the period of harvesting the crop there is an absolute difference in point of value between the weeded and unweeded, of at least 4*l.* 10*s.* per acre. But the advantages of weeding do not end here, for to whatever purpose the field may be turned as regards the next year's crop, the unweeded portion will necessarily require a great deal of extra labour to bring it into a proper condition; or if that is not bestowed upon it, the crop is sure to prove another failure.

We have upon more than one occasion spoken of the usefulness of *recorded* observations; and now, in the midst of harvest, we will avail ourselves of a few remarks, from a recent number of the 'Quarterly Journal of the Statistical Society,' upon the great importance of accurate returns of the corn produce of the land, and of the consumption of that produce by its inhabitants. The returns now made from the different corn-markets, in order to form the average prices regulating the importation duty on foreign corn, are faulty and incomplete. The writer of the article from which we are about to quote, sketches the machinery for the collection of the desired information; but into this part of the subject we shall not enter, as the necessity of the measure itself has first to be established.

"The importance of accurately knowing the provision made for the sustenance of the people is surely not less than that of knowing the yearly produce of various articles of commerce, which are employed as accessories in manufacturing processes. The condition of the crop of indigo in Bengal is accurately communicated to the merchants in London at the earliest moment when it can be known; and the information thus given has, through its influence upon the market-price, an immediate effect in checking or promoting consumption. The like result is known to attend upon the collection of information concerning the growth of hops in this country, the extent of land devoted to the cultivation of that article being known through the records of the Excise Office, the department which is entrusted with the collection of the hop-duty.

"It is now well known that the harvest of 1837 was deficient to so great a degree, that before the produce of 1838 was secured, the great superabundance of the two preceding harvests was all consumed, and the stock of grain throughout the kingdom was more nearly exhausted than we have known it to be at any period in modern times; so that if we could not have had recourse to foreign wheat then warehoused in our ports, we must have suffered most severely before the produce of 1838 could have been brought to market. So completely, however, was the public misinformed upon the subject, that, instead of a reasonable advance in price, sufficient to check consumption, which, as regards the most costly grain, wheat, had, it is well known, been long going on with unwonted profusion, the markets fell progressively during the months of August, September, and October, 1837, from 60*s.* 1*d.* to 51*s.* per quarter; and it was not until the middle of the following May that the average was again as high as it had been just before the harvest of 1837. By the third week in August the weekly average price had advanced beyond the rate at which foreign wheat is admitted on payment of the nominal duty of 1*s.* per quarter. It would not be possible to calculate with any tolerable accuracy the loss in money which this country has sustained through the want of information thus shown with regard to only one year's operations; but we can have no hesitation in believing that its amount must have been at least sufficient, if employed at interest, to provide in perpetuity for every expense that could accompany the most completely organised machinery for collecting agricultural statistics throughout the United Kingdom.

"The natural, the necessary tendency of any systematic and comprehensive inquiry, such as might be made by government agents acting under legislative sanction, would be to place the nation, as far as possible, beyond the probability of scarcity. It is well known, by everybody who has made any extensive inquiries concerning the state of agriculture as a science in various parts of the kingdom, that the advances made in some counties have not been hitherto followed in others; and it has been stated, in illustration of this fact, that, if all England were as well cultivated as the counties of Northumberland and Lincoln, it would produce more than double the quantity that is now obtained. To what can this discrepancy be owing, unless it be to the want of information, such as the public agents would collect in each county, and which could not fail to interest deeply every farmer throughout the whole extent of the kingdom? If the cultivators of land where agricultural knowledge is the least advanced could be brought to know, upon evidence that would not admit of doubt, that the farmer of Northumberland or Lincolnshire procured, from land of fertility not superior to his own, larger and more profitable crops than he is in the habit of raising, is it likely that he would be contented with his inferiority? The farmers of England have often been accused of an undue preference for the plans and processes employed by their ancestors, and their pertinacity in this respect has been contrasted with the rapidity that accompanies the march of improvement in mechanical and manufacturing processes. The reason for this difference is obvious. Manufacturers, residing in towns, are brought necessarily and constantly into collision; new inventions are continually brought under their notice, so that their results can be tested and judged with the greatest accuracy. Practical agriculturists, on the contrary, live apart; they come together but rarely, and have not that degree of acquaintanceship, the one with the other, which leads them, even when they meet, to the

interchange of professional experience. If the result of a successful experiment should at any time reach their ears, they cannot be certain that all the circumstances connected with its prosecution have been faithfully detailed, or that the advantages ascribed to a new method may not be the consequence of accidental causes, such as a propitious season, for instance. Men are generally prone to doubt everything that is not presented to their own observation, and this is especially the case with regard to improvements, which imply the mental superiority of others over ourselves. The manufacturer, on the contrary, sees for himself; he is not called upon to take anything upon trust; he can weigh and judge with the minutest accuracy all the circumstances of each case; and what he sees can owe no part of its success to other than human agency; what another has once done, he may always successfully imitate. The tendency of information, such as would be procured by the agency already described, would be in a great degree to remove the disadvantage in this respect under which the farmer now suffers. Results placed before him upon such unquestionable authority, resting not upon a single experiment only, but upon the practice of hundreds of men placed in the same circumstances as himself, must be received by him as undoubted facts, and he must be driven to the adoption of whatever might come thus recommended, with an alacrity equal to that which we see exhibited by the manufacturer.

"It is to be feared that the time is yet distant in which various classes of the same community will be willing to make the apparent sacrifice, each one of its own fancied advantages, on the altar of the general good, with the conviction that the share each must obtain of that good will prove an ample compensation for any peculiar benefit that may be relinquished. The contrary principle seems at present to be held with the greatest tenacity. It is besides feared that, if the public should acquire knowledge of any such peculiar advantages, those who possess them would be exposed to have them invaded. The agricultural is, in this country, what is called a *protected* interest; our cultivators, consequently, appear desirous of excluding inquiries which might have the effect of weakening their claim to the continuance of that protection. This fear is altogether chimerical. In Belgium, where the utmost publicity is given to every circumstance connected with the agriculture of the country, it has never been pretended that any advantage has been taken of that publicity; and if this can be truly said of Belgium, where the members of the legislative chambers have not by any means so great or so direct an interest in the landed property of the kingdom as is possessed by the members of our two houses of parliament, there cannot surely be any reason to dread lest injury should be thus occasioned in England.

"The information, which it appears to be so desirable to obtain with reference to the whole kingdom, is already easily procurable with regard to each individual farm by any person who has a sufficient interest to incite him to the task. The landlord, who is interested in extracting a due proportion of the produce of a farm under the name of rent, cannot find much difficulty in correctly estimating that produce. A similar facility attends the operations both of the tithe-proctor and of the parochial tax-gatherer. The knowledge is, in fact, already procurable by every one who can turn it to the disadvantage of the farmer; all that is wanted is to extend the information, so that the farmer himself may be placed in a condition to profit from its possession."

MONTHLY CALENDAR.—SEPTEMBER—Ninth Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock aft. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h. m.		h. m.	h. m.
1 Tu	245	Partridge shooting beg.	5 14	0 14	6 44	5·2	11m42	8a 2
2 W	246	. . .	5 16	0 33	6 42	6·2	0a56	8 25
3 Th	247	. . .	5 17	0 52	6 40	☽	2 6	8 57
4 F	248	. . .	5 19	1 12	6 38	8·2	3 8	9 40
5 S	249	. . .	5 20	1 32	6 35	9·2	3 59	10 36
6 *Su*	250	12 *Sunday after Trinity.*	5 22	1 52	6 33	10·2	4 37	11 43
7 M	251	. . .	5 24	2 12	6 31	11·2	5 5	morn
8 Tu	252	. . .	5 25	2 32	6 29	12·2	5 25	0 57
9 W	253	. . .	5 27	2 53	6 26	13·2	5 42	2 14
10 Th	254	. . .	5 28	3 13	6 24	14·2	5 55	3 32
11 F	255	. . .	5 30	3 34	6 22	○	6 8	4 51
12 S	256	. . .	5 32	3 55	6 20	16·2	6 20	6 10
13 *Su*	257	13 *Sunday after Trinity.*	5 33	4 16	6 17	17·2	6 33	6 31
14 M	258	Salm.Fish. in Scot. ends	5 35	4 37	6 15	18·2	6 49	8 55
15 Tu	259	. . .	5 36	4 59	6 13	19·2	7 9	10 22
16 W	260	*Ember Week.*	5 38	5 20	6 10	20·2	7 38	11 51
17 Th	261	. . .	5 40	5 41	6 8	21·2	8 19	1a14
18 F	262	. . .	5 41	6 2	6 6	☾	9 17	2 26
19 S	263	. . .	5 43	6 23	6 3	23·2	10 32	3 21
20 *Su*	264	14 *Sunday after Trinity.*	5 44	6 44	6 1	24·2	11 56	3 59
21 M	265	*St. Matthew.*	5 46	7 5	5 59	25·2	morn.	4 26
22 Tu	266	Autumnal Quarter beg.	5 48	7 26	5 56	26·2	1 23	4 45
23 W	267	. . .	5 49	7 46	5 54	27·2	2 48	5 0
24 Th	268	. . .	5 51	8 7	5 52	28·2	4 10	5 13
25 F	269	. . .	5 53	8 27	5 50	●	5 29	5 24
26 S	270	. . .	5 54	8 48	5 47	0·7	6 47	5 36
27 *Su*	271	15 *Sunday after Trinity.*	5 56	9 8	5 45	1·7	8 4	5 50
28 M	272	Jewish Year 5601 begs.	5 57	9 27	5 43	2·7	9 21	6 6
29 Tu	273	*MICHAELMAS DAY*	5 59	9 47	5 40	3·7	10 37	6 27
30 W	274	. . .	6 1	10 6	5 38	4·7	11 49	6 56

Meteorological Averages.

Barometer.	Ins.
Mean height	29·931
Highest .	30·410
Lowest .	29·410
Hygrometer.	°
Mean dew-point	52·3
Highest .	66
Lowest .	37
Mean dryness	5·5
Mean greatest do. of day	11·1
Greatest dryness	20
Thermometer.	
Mean temperature	57·8
Highest	76
Lowest	36
Radiation.	
Mean great. of Sun	32·7
Greatest power	54
Mean cold of terrest.	5·4
Greatest ditto	13
	Ins.
Mean qty. of rain	2·193
Mean of evap.	2·620

Table of the Winds.

	Days.	Dew-P.
N. .	2	45°
N.E. .	4	50
E. .	1	52
S.E. .	4	56
S. .	1	61
S.W. .	6	51
W. .	6	54
N.W. .	6	49 ·5

SUNDAY LESSONS.

Sep.		MORNING.				
6	12	af. Trin.	2 Kings	10	Matt.	7
13	13	„	„	19	„	14
20	14	„	Jerem.	5	„	21
27	15	„	„	35	„	28

Sep.		EVENING.				
6	2	Kings	18 ..	Rom.		7
13		„	23 ..	„		14
20		Jerem.	22 ..	1 Cor.		5
27		„	36 ..	„		12

THE MOON'S CHANGES.

First Quart. 3th day, 10h.38m. aft.
Full . . . 11th day, 7h.48m. aft.
Last Quart. 18th day, 5h.32m. aft.
New . . . 25th day, 6h.27m. aft.

Day of Mth.	Length of Day.	Day's decrease	Day break.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	
1	13 30	3 4	3 6	8 52	15′ 53″
6	13 11	3 23	3 17	8 37	15 54
11	12 52	3 42	3 28	8 22	15 55
16	12 32	4 2	3 39	8 9	15 57
21	12 13	4 21	3 49	7 55	15 58
26	11 53	4 41	3 58	7 42	15 59

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APPLE-HARVEST IN NORMANDY.

[Apple-gathering in Normandy.]

THE profusion of apple and pear trees, but more particularly of the former, that everywhere meets the eye in the rural districts of Normandy and the neighbouring departments to the north and east, is a matter of common observation among travellers, who, journeying, for instance, from Amiens to Beauvais in Picardy, a distance of more than sixty miles, pass through one continued avenue of fruit-trees of the kinds we have indicated. The cause of these fruits being grown so much more extensively in Normandy than in most of the other provinces of France, may doubtless be attributed to the unsuitable nature of its climate for the production of the grape, and the consequent necessity of supplying the absence of wine, the ordinary beverage of the French people, with cider and perry. The culture of the apple probably varies in some respects in different parts of the country, in accordance with the different habits and customs of the inhabitants; but the following method, which is that pursued in the orchards of the district of Le Bocage in Lower Normandy, will be found, we believe, on the whole, of general application.

To a stranger, one of the most striking features of a Norman orchard is the intermediate space between the trees laid out in pasture, or planted with crops of corn, hemp, flax, &c. It must be observed, however, that the best lands, when growing corn, are exempted from this double exaction. In soil of this character the trees are considered to decrease the value of the corn to at least as great an amount as they enhance the general product by their fruit. With these preliminary observations we now proceed to describe the general arrangement of the orchard. The trees are planted in rows about fifteen feet apart, so as to leave them all sufficiently exposed to the sun and air, and so as to enable carts conveying the manure (or during harvest time, the fruit) to pass freely to and fro. The trees produce most abundantly every other year. The greatest attention is paid to them in order to discover any dead or sickly individuals, which are instantly removed, and their place supplied from the nursery of young grafted trees, which is always kept on the farm. In planting the new tree, a round hole is made, about five feet in circumference and two in depth; at the bottom of this is placed a truss of barley straw or a faggot of furze, on which the root is set, and the hole again carefully filled up. Pallisades are then placed around the young plant, or if that be thought unnecessary, it is bound round with straw bands to prevent the sheep from rubbing against it or gnawing off the bark, or lastly, the trunk is merely rubbed with lime-water, which some think sufficient. When cows are pastured in the orchards, their heads are tied down with a halter that passes between their fore legs, and is attached to a surcingle which passes round the body, and which is fastened to a kind of breeching to hinder it from coming forwards: the object of this precaution is of course to prevent the animals from plucking the fruit from the trees. So careful are the owners on this point, that before the middle of August, when the fruit begins to fall, they remove the cattle entirely from the orchards, considering the apples injurious to them. The growers are not very choice as to the species of apple, although some of the finest sorts we have brought to our own tables come from the orchards of Normandy.

The apple-harvest begins about the beginning of October, when men, women, and children sally forth with their long poles to beat down the fruit, with their baskets to convey it to the cart, and with the little barrel of cider to cheer them during their somewhat arduous toils under a blazing sun. The apples are thus collected into great heaps, where they lie till the middle of November, when they are carried to the cider-press. The cider made of the first pressing is a very heady and strong liquor, as the peasants but too frequently prove. In years of great abundance a portion of this cider is distilled into brandy. On the second pressing, a great quantity of water is added, and the product is a small cider, the ordinary liquor of the labourers and domestics.

After the orchards are ploughed, cropped, and sown with grass, they remain, like the other pastures of the country, in that state for four years; they are then ploughed up, and have a succession of crops in the order following: buckwheat, hemp or flax, then wheat or rye, followed by peas or tares, barley or oats; either of the last two being sown with clover. Even when the apple-trees are thus planted in the midst of valuable crops, their fruit bears a considerable proportion to the value of the whole; that proportion being seldom less than a fourth, often a third, and in some cases amounting to one half. Of the apples imported into England, a large part comes from Normandy and other parts of France; the remainder we receive principally from the United States and Belgium. The amount of the imports for home consumption, on an average of the three years ending with 1822, was 57,347 bushels a year; in the three years ending 1837 it had declined to 15,645. The duty was, till recently, four shillings a bushel; but by the act 1 and 2 Vict., c. 113, it is made five per cent. on the value, which, from the 16th of August, 1838, when the act came into operation, to the end of the year, amounted to 33,395*l.*, producing a duty of 2116*l.*

DOMESTIC CHEMISTRY.

VI.—ROASTING, FRYING, AND BROILING.

In our last article on "Domestic Chemistry" ('Penny Magazine,' No. 381), we treated of the nature of animal and vegetable substances, and of the remarkable and valuable changes induced upon them by the action of boiling water in preparing them for the food of man. We propose now to consider the nature of other culinary operations, such as roasting, frying, and broiling.

The art of roasting a joint of meat, however simple it may appear, is nevertheless an operation which can be conducted with success only by one who has had much experience in the art. A modern French writer on cookery says that "the art of roasting victuals to the exact degree is one of the most difficult things in the world to accomplish, and it is easier to meet with half a dozen good cooks than one roaster who is master of this branch of his art." It is not our purpose to instruct the reader as to the manner of roasting his meat, because we should be very likely to fail in attempting by a written description to make easy and intelligible "one of the most difficult things in the world," and because our object is rather to trace the various changes which a piece of raw meat undergoes before or on the fire during the process of cooking; leaving it to the reader's practice and experience to decide when the joint is "done to a turn."

But first let us say a few words respecting the *spit*, and the means by which the meat is kept in constant motion, so as to prevent the fire from scorching it. In former times the spit was turned by little boys, and afterwards by dogs; but as our mechanical arts improved, self-acting machinery was invented for the purpose. The meat being impaled on a steel bar or spit, the latter had to be kept in rotation by some means or other; and in days when labour was cheap, and when a large number of domestics were kept by private families, a boy, often a dwarf, was destined to this employment. Boy-turnspits were alluded to more than six hundred years ago; but in later times they were superseded by dogs of a peculiar breed, having short legs and short curly tails. These dogs were put into a kind of hollow wheel or wire drum connected with the spit, and, by a sort of treadmill motion, kept it in rotation during the roasting of a piece of meat: this they were taught to do by rather a cruel method, for it is said that they were first put into the wheel with a few burning coals, and kept constantly in motion to avoid burning their feet. These living turnspits were afterwards replaced by smoke-jacks, which act in the following manner:—some distance up the chimney is placed a little kind of wheel, with spokes or vanes lying obliquely; the ascending heated air turns this wheel round on principles precisely the same as those by which the sails of a windmill are moved by the wind: this motion, once produced, is communicated to the spit by connecting wheelwork. Another sort of jack is that in which the rotation is produced by a heavy weight: a long line or chain is coiled round a barrel, and in coiling draws up a heavy weight to a considerable height: this weight, by afterwards descending slowly, causes the spit to rotate, through some intervening machinery. Lastly, we may allude to those improved modern forms of the jack, in which the rotation of the spit is kept up by the motion of a kind of clockwork enclosed in a case, and which requires winding up from time to time.

The first action of fire upon meat freely exposed to its influence is to melt out some of the more readily fusible parts, such as the fat; and as the surface becomes heated, the watery portion is dissipated in the form of vapour, thereby imparting to the food an entirely new flavour, peculiar to roasting as distinguished from boiling and baking. The temperature of the meat scarcely rises above that of boiling water until the watery parts are all evaporated; but when these watery parts are driven off, a decided change in the chemical combination of the elements of the meat commences: the surface becomes *browned*, showing the beginning of carbonization; and several compounds result, which are far more savoury than can be obtained by boiling. A brisk fire will cause a rapid current of air to be constantly passing over the meat, and this is favourable to the process; for the interior of the joint thereby acquires a fine flavour without ceasing to be tender, and the outside is brown, crisp, and pungent both in taste and smell. In baked meats, where the watery parts of the meat cannot escape freely (because there is no current of air to carry them off), the interior becomes soft and flaccid, even though the exterior has the browned appearance produced by roasting.

The fat of meat is contained within a cellular substance, which undergoes great contraction by the action of a high temperature: the heat melts the fat, and the contraction of the cellular substance forces it out to the surface, where it falls down into the dripping-pan. But if the fat be all removed, and the watery parts all evaporated, the result would not be roast, but burnt meat; it would become hard and tasteless on the outside, while the inside would remain almost raw. To prevent this, the meat is basted: the liquid fat from the meat runs down the sloping sides of the dripping-pan into a sort of well, which, from its proximity to the fire, retains the fat in a liquid state, and the fat thus collected is every now and then taken up in a basting ladle and poured over the meat. This not only prevents the juices of the meat from passing off in the form of vapour, but also prevents those juices from becoming vapour, an important distinction; for, as Mr. Donovan justly observes, "It is the vapour which produces the ill effect, whatever that may be, on the meat, and not the liquid which produced the vapour;" and again, "Vapour effects a variety of changes in animal and vegetable substances, which the same vapour condensed into boiling water is incapable of." Thus it will be seen

that the simple operation of basting is very important: the surface of the meat is covered with a quantity of melted fat mixed with a little watery juice, and the temperature rises to a browning heat only, instead of being sufficient to burn the meat; but, on the other hand, if the meat were basted with watery juices in which a very little fat were mingled, the browning temperature could not be attained, because a mixture of a large quantity of water and a little fat boils and passes off as vapour at about 212°, a temperature insufficient for browning; whereas if the proportions of water and fat be reversed, the meat can become hot enough to brown, because fat boils at so high a temperature as 500° or 600°.

To judge the exact time when the roasting of a joint of meat is completed, is a matter of experience and observation. The roasting being complete, and the heat still kept up, the chemical changes proceed, but the results are different: the fibre of the meat is no longer firm and elastic, but becomes soft and glutinous, and is in fact being converted into gelatine; the rich juices which impart flavour and nutritiousness to the meat are forced out by the shrinking of the joint when thus subjected to the prolonged heat, and the value of the meat is considerably diminished by being overdone.

Meat of the best quality will not part with its juice or gravy by the simple process of roasting, unless overdone, or unless the very absurd practice of puncturing the meat all over be adopted; but some descriptions of meat will part with the gravy whether they be overroasted or not: for example, old wether mutton will not do so unless overroasted, but old ewe mutton will have that defect by the simple act of roasting.

It appears from the foregoing remarks, that roast meat is not only more nutritious, but probably also more economical, than boiled meat. In roasting a joint, the heat dissipates water and a small portion of odorous and volatile substance of no great importance; and unless overdone, the other juices are diffused throughout the flesh, thereby making it highly palatable, nutritious, and easy of digestion. In boiling meat, some of these juices flow out into the water and are lost.

The process of *frying* is very different from that of roasting. The reader is probably aware that when water in an open vessel is placed on the fire, it constantly rises in temperature until it attains 212°, the boiling-point; it then boils away, without becoming at all hotter, however much we may increase the heat below it. But when fat or oil is similarly treated, the temperature rises to 500° or 600° before boiling commences; and even then these liquids do not boil as water does, but at that high temperature they begin to blacken and decompose. Now by mixing water and fat, we elevate the boiling-point of the one, and depress that of the other; and by graduating the proportions of water and fat, we can get any temperature for the boiling-point between 212° and about 550°. If, for example, we place some fresh hog's-lard in a fryingpan on the fire, it soon melts and acquires a temperature of about 212°; it then makes that crackling noise peculiar to frying, and then boils: the temperature now remains nearly fixed, because the fresh lard contains a small quantity of water, which, separating from the lard, forms a layer beneath its surface. In this state the water is formed into innumerable bubbles of steam, which, bursting through the layer of lard, cause slight explosions, and hence the noise in frying is accounted for. When the water is thus all evaporated, the noise ceases, and the temperature of the lard rises till it attains nearly 600°; it then begins to decompose, an inflammable gas is liberated, and nothing of the lard remains but its carbon in the form of a black mass.

We can now understand what occurs during the process of frying. In frying meat or fish, a quantity of some fatty substance is placed in the fryingpan; the meat supplies the water; and a temperature between the boiling points of water and of fat is soon attained; this temperature is sufficient to brown the meat, as in roasting, provided the quantity of water be not too large, because in such case meat becomes sodden before the water is evaporated. Hence fish which are to be fried are first well dried with a cloth, and the fat in the fryingpan is allowed to attain nearly a boiling temperature before the fish are put in: the water is thus speedily evaporated, and the frying process quickly completed, which prevents the dissipation of the volatile flavour.

With regard to another analogous operation, *broiling*, we may remark that there is not much difference between it and roasting, except in temperature: in the latter case, the heat is slow and penetrating; in the former, it is fierce and rapid. The brisk rapid heat produces a greater chemical change in the composition of the meat, and thus induces a higher degree of flavour than in the case of roast meat. The first action of broiling is to dissipate the watery parts of the meat; the surface is then browned, and the juices are thereby prevented from flowing out: hence it will be seen how important it is not to pierce the broiling meat with a fork, but to turn it by some other means.

Naturalist's Walk.—The little excursions of the naturalist, from habit and from acquirement, become a scene of constant observation and remark. The insect that crawls, the note of the bird, the plant that flowers, or the vernal leaf that peeps out, engages his attention, is recognised as an intimate, or noted for some novelty that it presents in sound or aspect. Every season has its peculiar product, and is pleasing or admirable from causes that variously affect our different temperaments or dispositions; but there are accompaniments in an autumnal morning's woodland walk that call for all our notice and admiration: the peculiar feeling of the air, the solemn grandeur of the scene around us, dispose the mind to contemplation and remark; there is a silence in which we hear everything, a beauty that will be observed. The stump of an old oak is a very landscape, with rugged Alpine steeps bursting through forests of verdant mosses, with some pale, denuded, branchless lichen, like a scathed oak, creeping up the sides or crowning the summits. Rambling with unfettered grace, the tendrils of the briony (*tamus communis*) festoon with its brilliant berries, green, yellow, red, the slender sprigs of the hazel or the thorn; it onaments their plainness, and receives a support its own feebleness denies. The agaric with all its hues, its shades, its elegant variety of forms, expands its cone sprinkled with the freshness of the morning: a transient fair, a child of decay, that 'sprang up in a night, and will perish in a night.' The squirrel, agile with life and timidity, gambling round the root of an ancient beech, its base overgrown with the dewberry (*rubus cæsius*) blue with unsullied fruit, impeded in his frolic sports, half angry, darts up the silvery bole again, to peep and wonder at the strange intruder upon his haunts. The jay springs up, and screaming, tells of danger to her brood: the noisy tribe repeat the call, are hushed, and leave us. The loud laugh of the woodpecker, joyous and vacant; the hammering of the nuthatch (*sitta Europæa*) cleaving its prize in the chink of some dry bough; the humble bee, torpid on the disc of the purple thistle, just lifts a limb to pray forbearance of injury, to ask for peace, and bids us

"Leave him, leave him to repose."

The cinquefoil, or the vetch, with one lingering bloom yet appears, and we note it for its loneliness. Spreading on the light foliage of the fern, dry and mature, the spider has fixed her toils, and motionless in the midst watches her expected prey, every thread and mesh beaded with dew trembling with the zephyr's breath. Then falls the "sere and yellow leaf," parting from its spray without a breeze, tinkling in the boughs, and rustling scarce audibly along, rests at our feet, and tells us that we part too. All these are distinctive symbols of the season, marked in the sobriety and silence of the hour, and form perhaps a deeper impression on the mind than any afforded by the verdant promises, the vivacities of spring, or the gay profuse luxuriance of summer.—*Journal of a Naturalist.*

LEITH.

[Leith Harbour.]

THIS important seaport town is pleasantly situated on the banks of the river Leith, at its confluence with the Frith of Forth, and at a distance of about one mile in a north-eastern direction from Edinburgh, of which Leith is the port and harbour. The former name of the place was Inverleith: both appellations are derived from the river. From a very early period the prosperity of Leith appears to have been constantly retarded by the jealousy of the Edinburgh corporators, who exercised almost despotic power over its trade and commerce. In 1329 the harbour of Leith was granted to the men of Edinburgh by Robert I.; but for some time the grant was found almost valueless, owing to the opposition offered by the family of Logan, to whom the banks of that part of the river which intervened between the two places belonged. After many disputes, a right of way was purchased by the corporation of Edinburgh, and also the exclusive privilege of trading, keeping warehouses, and opening houses of entertainment for strangers in Leith; so that the inhabitants of the latter were absolutely debarred from the only profitable employments that may be said to have been natural to their position. But even this was not enough; for in 1483, it being discovered, we presume, that the previous regulation left one opening for the capital and enterprise of the people of Leith, namely, a partnership with the merchants and others of Edinburgh who were admitted into the enjoyment of the monopoly, an act of council was passed, prohibiting citizens of the latter place from entering into partnership with the inhabitants of the former. In 1555 the people of Leith endeavoured to relieve themselves from their injurious dependency, by obtaining the assistance of Mary of Lorraine, queen dowager and regent of Scotland: they were so far successful as to get Leith erected into a burgh of barony, with the further assurance that that step was only preparatory to the making it an independent burgh royal. The 'superiority' was on this occasion purchased from Robert Logan of Restalrig for 3000*l.* Scots; and a few days after the settlement of this preliminary to the comparative independence of Leith, the regent granted letters patent empowering the inhabitants to choose bailiffs for their better government, and charters to enable them to erect divers of their arts and trades into corporations. "But," says Maitland, in his 'History of Edinburgh,'* "the queen regent died soon after, to the great loss and grief of the inhabitants, who, instead of having anything further done for their service, had the misfortune to learn that the king and queen had granted the 'superiority' of their town to the Edinburghers for the sum of ten thousand marks, and the reversion thereof, which the town-council of Edinburgh many years after purchased of Lord Thirlstane, for the sum of 14,000 marks; whereby the unfortunate Leithers were in as bad a condition as formerly; nay, I may say worse, by the loss of their money paid for the superiority aforesaid, for I cannot learn that it was ever returned. However, from this period, I think, we may date Leith's being called a town; for before this time, it having had neither magistrate nor corporation, could only be reckoned a village." There are two or three circumstances connected with the general history of Leith that we must not omit to mention. In 1541 the Earl of Hertford, at the head of an English army, took, sacked, and burned the town. Eight years later, Mons. de Desse, the French general, began to fortify Leith, in order to secure a convenient place of landing for the French troops. This General was then in Scotland to support the pretensions of Francis II., king of France, to the throne, which the latter founded upon his marriage with Mary, the unfortunate Queen of Scots. He built a fortress of rectangular form, consisting of eight bastions. This matter giving great uneasiness to the Protestants of Scotland, they applied for assistance to Queen Elizabeth, who sent them an army. The united English and Scottish forces sat down before Leith in April, 1560. The siege was continued with varying results until July, when a peace was concluded, and the English and French soldiers returned to their respective countries. About 1783 a battery of nine guns was erected on a spot commanding the harbour, in consequence of the appearance of the notorious Paul Jones off the coast with three

* p. 487.

armed ships, and who threatened to destroy all the vessels in the road and harbour. This battery has since been enlarged into a fort, which is garrisoned by the royal artillery.

Leith, with Portobello and Musselburgh, returns one member to parliament. It comprises two districts or parishes, lying on opposite sides of the river, and known respectively by the names of North and South Leith: their united population in 1831 was 44,294. The older streets of both are in general narrow, irregular, badly paved, and dirty; but the more recent erections have greatly improved the appearance of the town. Among the public buildings we may first notice the parish church of South Leith, in the Kirkgate, anciently known by the name of St. Mary's Chapel. This is a Gothic edifice, with a massive steeple tower. It was made the parish church in 1609, in consequence of the demolition of the previous edifice by the General Assembly, on account of the statues of martyrs and saints with which it was ornamented. Near the church is the hospital of James VI., founded by the Kirk Session in 1614, and which was formerly used as a grammar school; and opposite this is the Mariners' Hospital, or Trinity House, which was founded in 1555, and rebuilt a few years since very handsomely. In Constitution Street is a neat chapel, belonging to the Episcopal church of Scotland. At a short distance from Leith eastward are very elegant and commodious baths. North Leith possesses two churches, the old one situated at the west end of the ancient stone bridge which crosses the river, and which formed part of St. Ninian's chapel, anciently dependent on the abbey of Holyrood; and a new one, erected nearly twenty years ago, and which is large and handsome, having a fine portico, and a tower and spire rising to the height of one hundred and forty feet. North-west of the former church is the site of a citadel erected by Cromwell, and which was destroyed at the Restoration; the only remains is the eastern gate: the space occupied by the citadel forms now a portion of the basins for the shipping. The other chief public buildings are the town-house, custom-house, assembly-rooms, the two prisons (the older of which, an old-fashioned building standing at the bottom of Tolbooth Wynd, was erected in 1565, and the other in 1822), and lastly the high school. At the foundation of this school the endowments are said to have been considerable; but in 1831 the funds were insufficient to pay the salaries of the teachers. In that year the late Dr. Andrew Bell, by deed, appointed the magistrates and heads of the corporation trustees for money in the funds amounting to 9789*l*., which was to be appropriated to the foundation of schools on the Madras system. No new school, however, has been established; but two teachers have been appointed to the high school, to teach upon the system indicated by Dr. Bell. During the ten years preceding 1836, the number of pupils varied from one hundred and sixty to two hundred and fifty. There are six classes, namely, two for the classics, one for the mathematics, one for writing and arithmetic, and two for English. The fees for the first two are 15*s*. per quarter, and for the other four 7*s*. 6*d*. per quarter.

Numerous and extensive improvements have been made at different periods in the port and harbour. At the beginning of the last century a considerable sum of money was expended by the corporation of Edinburgh in the erection of a stone pier, which was made to extend for some distance into the sea, and on which, at its extremity, a lighthouse was erected. In 1777 a new quay was built on the north side of the harbour, which was at the same time made wider and deeper. There are two dry docks for building and repairing vessels, a branch of industry carried on here to a great extent; and two wet docks, one opened in 1806, and the other in 1817, each of which is three hundred feet wide, and between seven hundred and eight hundred feet long, occupying together, with their appurtenances, about three hundred acres. The cost of their erection was 250,000*l*. They are both of sufficient depth to admit vessels of from two hundred to two hundred and fifty tons burden. Around these basins are well-constructed quays, and extensive warehouses for the reception of merchandise. Vessels of large size cannot enter the port, the depth of water in the harbour being only sixteen feet at spring-tides and ten at neap; but ships of any size find excellent anchorage in the roads about a mile from the mouth of the harbour. Leith enjoys an extensive commerce with the Baltic, the northern parts of Europe, Holland, France, Spain, Portugal, and the Mediterranean, with North America, and with the West Indies: it has also a large coasting trade, and a considerable share in the whale and herring fisheries. Among the other evidences of the growing prosperity of the town may be classed the various domestic manufactories which meet the eye of the spectator—the numerous rope-works and canvass manufactories, the two establishments for sugar refining, the various extensive breweries—the glass-houses, the soap-works, the iron-foundry, and the card manufactory, &c. This prosperity, however, it is stated, would have been greater but for what is called the unfair conduct of the corporation of Edinburgh in increasing the rate and number of the port dues, which is said to have caused various branches of commerce to be transferred to other places. The net proceeds of the custom-duties for the year 1838 were 511,970*l*. The number of ships that entered the port in 1838 was two hundred and forty-four British, and two hundred and fifty-three foreign; the total amount of tonnage being 60,859.

By the charter granted by the queen regent, as before mentioned, the people of Leith were divided into four classes, each of which became an incorporated body. These are known by the respective names of the 'ship-masters' (usually termed the 'Trinity House'); the 'traffickers,' or 'merchants' company;' the 'maltmen;' and the 'trades,' the last of which possesses exclusive privileges. The municipal government of the town is, in accordance with the act 3 and 4 William IV., vested in a provost, four baillies, a treasurer, and ten common-councillors. The police of the town exists under the regulations of a local act, 7th and 8th of George III., and the expense is defrayed by an assessment of 1*s*. 6*d*. in the pound upon the rent of all lands and houses whose yearly rent is not less than 3*l*. In consequence of the close connection that has so long existed between Edinburgh and Leith, the chief revenues of the latter, including the port duties and the imposts levied within the borough, form a portion of the revenues of the former: its debts, with trifling exceptions, are in the same position. The most important of the debts are those contracted with government to defray the expense of the docks, which, in 1835, amounted to 245,992*l*. The property that belongs exclusively to the corporation of Leith was estimated, in 1833, at 5824*l*., from which had to be deducted engagements to the amount of 3818*l*. Its income was at that time 196*l*., and its expenditure 35*l*.

HORSE ARMOURY IN THE TOWER.—XII.

Robert Devereux, Earl of Essex.

The great favour which this nobleman enjoyed from Elizabeth (who seemed to evince for him an affection greater even than that with which she had before regarded the unworthy Leicester), joined to his own good qualities, his heroic bravery, his talents, and his open and honourable bearing, have gained for him from posterity an admiration almost as great as the popularity he enjoyed during his lifetime. Even his errors and his conduct in the unhappy events which caused his fall are more deserving our pity than our censure, since they show the sincerity of his heart, and how remote was his disposition from all cunning or hypocrisy

Robert Devereux, the second Earl of Essex, the son of Walter Devereux, the first earl, and Lettice, daughter of Sir Francis Knollys, a relation, at no great distance, to Anne Boleyn, the queen's mother, was born at Netherwood in Herefordshire, November 10, 1567. In his youth he gave so little promise of his future eminence, that even his father considered him little better than an idiot. He had not attained his tenth year when he succeeded to the title. His father had confided him to the guardianship of Lord Burghley, and to the care of his friend the Earl of Sussex, whose advice and example no doubt mainly contributed to the great change which now took place in the character of the young earl. In 1578 he entered himself as student of Trinity College, Cambridge, where he became very assiduous in his studies, devoting his time with great application as well to the severer orders of learning as to the more polite branches of education.

He remained at the University till he had obtained the degree of Master of Arts, and left in 1582, distinguished for the ease and fluency of his compositions, and for his eloquence, insinuating from its sweetness, and impressive from its force and the strength of his arguments. His manners were engaging, and his temper, at this period, mild and compliant, with a graceful seriousness in his countenance approaching to melancholy.

From the University he retired to one of his family mansions in South Wales, where he became so attached to the pleasures of a rural life, that it required much persuasion on the part of his friends to induce him to leave it and take part in those higher duties to which his high birth and attainments were more suited. However, in 1584 he made his appearance at court, patronised by his father-in-law, the Earl of Leicester, then in the zenith of his power. The graces of his person, his affability and shining qualities, immediately produced a favourable impression, and contributed, with the remembrance of his father, to make him many friends. He accompanied Leicester in his expedition to the Low Countries, where, although only eighteen, he received his commission as general of the horse, and distinguished himself greatly in the campaign, especially at the battle of Zutphen, where his heroism was only eclipsed by the surpassing glory of the last action of Sir Philip Sydney. On his return he was appointed to the distinguished post of master of the horse, then just vacated by Leicester for a higher office.

The partiality of Elizabeth for the young nobleman was now apparent to all, and Essex rapidly rose to a degree of favour which Leicester, great as had been his influence, never enjoyed. On the occasion of the expected attack from Spain, the queen decorated him with the order of the Garter, and remitted a debt to the exchequer incurred by his father. Leicester died in 1588, and Essex now seemed to have the first place in the queen's favour; yet, so little care did he take to secure it, that, on the departure of Drake and Norris, who had undertaken to restore Don Antonio to the throne of Portugal, he suddenly disappeared from court, and sailed after the expedition with the intention of taking part in it as a volunteer. This abrupt and secret departure might have been expected to excite the wrath of a woman with such an exacting disposition as Elizabeth's, and it was with no slight degree of anger that she heard of his conduct. She immediately sent the Earl of Huntingdon to Plymouth to recal him, but he was too late: Essex had sailed. She then wrote to him commanding his return; and the following copy of the letter addressed to him on that occasion will evince the angry feelings he had excited:—"Essex—Your sudden and undutiful departure from our presence and your place of attendance, you may easily conceive how offensive it is and ought to be unto us. Our great favours bestowed upon you without deserts hath drawn you thus to neglect and forget your duty, for other construction we cannot make of these your strange actions. Not meaning therefore to tolerate this your disordered part, we gave directions to some of our privy-council to let you know our express pleasure for your immediate repair hither, which you have not performed, as your duty doth bind you, increasing thereby greatly your former offence and undutiful behaviour in departing in such sort without our privity, having so special offices of attendance and charge near our person. We do therefore charge and command you forthwith, upon the receipt of these our letters, all excuses and delay set apart, to make your present and immediate repair unto us, to understand our further pleasure; whereof see you fail not as you will be loth to incur our indignation, and will answer for the contrary at your uttermost peril. The 15th of April, 1589."

Before he received this letter he had joined the expedition on the coast of Portugal, had marched to Lisbon as a volunteer, and in the engagements which ensued had behaved himself with great gallantry and humanity. On his return he found that, in spite of his disobedience, he had not entirely lost the queen's favour, and in a short time it was manifest that her partiality to him was greater than ever. But it was not long before his jealous mind fancied he beheld a rival in the queen's favour in the person of Sir Charles Blount (afterwards Lord Mountjoy, Earl of Devonshire). This gentleman, having distinguished himself at a tilt, was rewarded by the queen with a chess-queen of gold enamelled, which he tied upon his arm with a crimson riband. Essex perceiving it, said with affected scorn, "Now I perceive every fool must have a favour." These expressions led to a duel, in which Essex was wounded in the knee. It is uncertain whether the remark of Elizabeth, on hearing this, "that unless some one took him down, there would be no ruling him," proceeded from anger or was said ironically; but it is certain that the act of the earl did not injure him in his advancement, and it is highly probable that to the queen's vain temper it was not disagreeable. He again, however, hazarded her displeasure by an act which she found it more difficult to forgive; this was his secret marriage with the widow of Sir Philip Sydney, which she alleged was unequal to his greatness, and by which the honour of his house, she said, was degraded—"degraded (indignantly exclaims a modern writer) by his having married the daughter of Sir Francis Walsingham and relict of Sir Philip Sydney!"* But after the first burst was over, she refrained from manifesting the resentment which she certainly felt.

In 1591 he obtained the command of a force of four thousand troops sent by Elizabeth to assist Henry IV. of France in the siege of Rouen. He distinguished himself by a chivalrous gallantry in many skirmishes here, but the object of the expedition being disconcerted by the want of the co-operation of the French, and his opinion respecting the mode of proceeding in the siege having been rejected by the king, he returned, after an absence of some months, in deep chagrin and disgust.

This dark mood was not at all sweetened when he found, on his return, that his enemies had been busily employed in endeavouring to excite the queen against him. She was more particularly offended with him that he had, of his own authority, created several knights in the late expedition; but he found means to excuse himself for this presumption, and in a short time saw the whole machinations of his enemies overthrown. In 1593 Elizabeth named him a member of the privy-council. In the month of June, 1596, a fleet of one hundred and fifty sail, with fourteen thousand land troops, having been provided for a projected attack on Spain, the Earl of Essex took the command of the army, the fleet being under the control of the lord admiral, and again left the distraction of party politics for the tumult of war. The fleet soon arrived at the bay of Cadiz, and, in defiance of

* Lodge.

the fire from the forts and battlements and fifteen large men-of-war, they got into the harbour, where, after a fierce fight, which lasted six hours, three of the largest Spanish ships were taken, and fifty-seven Spanish ships of war and merchantmen were taken, plundered, or burnt. As soon as this was over, Essex landed a part of the land force, and on the next day he forced the city of Cadiz to capitulate. The inhabitants paid twelve thousand crowns for their lives; their houses, merchandise, and goods of all kinds were plundered by the conquerors; and the whole loss sustained by the Spaniards on this occasion was estimated at twenty millions of ducats. On the return of this expedition, after only ten weeks' absence, Essex was annoyed to find that the queen, instead of thanking him for his services, only expressed herself mortified at the small amount of the plunder deposited in her treasury. His enemies, the principal among whom were the Cecils, now took advantage of the queen's indisposition towards him, and pressed him closely on all sides. Essex found himself rapidly sinking under these accumulated attacks, when a lucky accident came to his assistance. The Spanish treasure-ships from the New World arrived safely in Spain with twenty millions of dollars on board. Essex maintained that he had projected a voyage from Cadiz to Terceira for the purpose of intercepting this rich prize, and that he certainly should have succeeded in doing so had he not been thwarted and overruled by the creatures of the Cecils.

The tables were now completely turned; Essex was taken again into favour, while Burleigh was called, to his face, a miscreant and a coward, and for a time forbidden the court. But Essex could not remain tranquil, and a refusal on the part of the queen to appoint his relative, Sir Robert Sydney, to a post which he solicited for him, proved too much for his highly exciteable temperament. He left the court, and was mounting his horse to go into Wales, when the queen pressingly recalled him, and to pacify him made him Master of the Ordnance.

His warlike disposition caused him to undertake another Spanish expedition. This fleet, under the direction of Essex as commander-in-chief, Lord Howard as vice-admiral, and Sir Walter Raleigh as rear-admiral, set sail in August, 1597, returning in October, but without having succeeded in effecting all that was intended, though they succeeded in making captures to the amount of 100,000*l*. The queen received Essex with reproaches and discontent, and the expedition was generally deemed a failure. He now retired to Wanstead, angry on several accounts; but the chief of these was the elevation of the lord admiral to the earldom of Nottingham, by which he thought himself doubly affronted; first, because Lord Howard's services at Cadiz were recited in the patent; and in the second place because, by his new title, the lord admiral gained precedence of him, according to a regulation made in the reign of Henry VIII. He was pacified by being made hereditary earl-marshal, which, by the same regulation, restored him to his rank.

On the death of Burleigh, he succeeded him as Chancellor of the University of Cambridge. About this time a singular incident took place, which strongly marked the impetuous mind of the earl, and which doubtless had considerable effect upon his after-fortune. A private council was held on the choice of a proper person to be sent as governor of Ireland. Essex proposed Sir George Carew, but the queen was more inclined to Sir William Knollys. The dispute became warm, and Essex, unable to persuade her majesty, contemptuously turned his back upon her. Provoked at his insolence, the queen gave him a box on the ear, and bade him go and be hanged. He immediately clapped his hand on his sword, and swore he neither could nor would put up with such an affront, which he would not have taken from Henry VIII. himself. The lord admiral interposed, and Essex withdrew in high wrath. In answer to a letter of remonstrance from the lord keeper Egerton, he thus replied:—"When the vilest of all indignities are done unto me, doth religion enforce me to sue? Doth God require it? Is it impiety not to do it? Why? Cannot princes err? Cannot subjects receive wrong? Is an earthly power infinite? Pardon me, pardon me, my lord; I can never subscribe to these principles. Let Solomon's fool laugh when he is stricken. Let those that mean to make their profit of princes show to have no sense of princes' injuries. Let them acknowledge an imperial absoluteness on earth, that do not believe an infinite absoluteness in heaven. As for me, I have received wrong; I feel it: my cause is good; I know it: and, whatsoever comes, all the powers on earth can never show more strength or constancy in oppressing than I can show in suffering whatever can or shall be imposed on me."

It was some months before he could be induced to make any acknowledgement to the justly incensed queen, but being at length persuaded to make a proud submission, he was restored to apparent favour; though it is probable his violence was never really forgiven.

The troubles in Ireland from the rebellion of Tyrone at this time continuing, it was proposed to send over a new governor, and with the hope that his rank and military popularity and power might prevail in that country, he accepted the commission of lord-lieutenant. Before his departure he addressed to the queen another of his strongly marked letters, in which the following beautifully energetic expressions occur:—

"From a mind delighting in sorrow, from spirits wasted with passion, from a heart torn in pieces with care, grief, and travel, from a man that hateth himself and all things else that keep him alive, what service can your majesty expect, since any service past deserves no more than banishment and proscription to the cursedest of all islands. It is your rebels' pride and success must give me leave to ransome myself out of this hateful prison, out of my loathed body, which, if it happen so, your majesty shall have no cause to mislike the fashion of my death, since the course of my life could never please you."

It will be needless to dwell on the details of this unfortunate expedition. After an absence of six months, he left the government of Ireland in the hands of the Archbishop of Dublin and Sir George Carew, and, without waiting for any order or permission, hastened to London. "Upon Michaelmas-eve, about ten o'clock in the morning, he alighted at the court-gate in post, and made all haste up to the presence, and so to the privy-chamber, and stayed not until he came to the queen's bed-chamber, where he found the queen ready up, with her hair about her face; he kneeled unto her, kissed her hand, and had some private speech with her, which seemed to give him great contentment; for when he came from her majesty he was very pleasant, and thanked God, though he had suffered much trouble and storms abroad, he found a sweet calm at home."

The calm, however, only lasted a few hours; the queen gradually worked herself into a passion, and before the day was over, Essex received an order from her majesty to consider himself a prisoner in his rooms. On the next day the lords sat in council, and called Essex before them, when he answered all their questions with temper, gravity, and discretion. He was, however, committed to the Tower, whence he was not released until he had languished there in sickness and solitude nearly twelve months, during which time he was denied even the society of his wife and the attendance of his physician. On the 26th of August he was released from custody, but was told not to appear at court, and was suspended from the privileges and authority of his offices. A few days after his release a valuable patent for the monopoly of sweet wines, which he had held for some years, expired; he petitioned for a renewal of it as an aid to his

shattered fortunes; but the queen, saying that "to manage an ungovernable beast, he must be stinted in his provender," positively refused.

Essex now became desperate, and, prompted by his secretary Cuffe, he determined, if possible, to remove Cecil, Cobham, and Raleigh, his great enemies at court, by force from the queen's councils. In order to strengthen his interest, the gates of Essex House were thrown open to all persons who were discontented with the queen or her advisers. The numbers who flocked thither excited the attention of the vigilant government, and Essex, being summoned before the council, determined immediately to strike the blow for which he had been some time preparing. On the evening of the day on which he had received the summons to appear before the council, he sent messengers to all his friends, informing them that his life was threatened by Raleigh and Cobham, and beseeching them to assemble at his house to give him their protection.

In consequence of this, lords Sandys and Monteagle, the earls of Rutland and Southampton, with about three hundred other gentlemen, arrived during the night at Essex House, where it was divulged that Essex had resolved at once to rid himself of his enemies by forcing his way to the queen, and informing her of his danger from those who had so long abused their influence with her majesty. Collecting all his friends and dependants, he determined to set out on the following morning (Sunday, February 8, 1600-1), during sermon time, for St. Paul's Cross, where he expected the Londoners to join him. As they were about to set forth, the lord-keeper and others arrived from the queen, to inquire the cause of the tumultuous assemblage. These, after a short parley, he locked up in a room of his house, placed over them a guard of musqueteers, and then, drawing his sword, rushed out, followed by his friends, shouting "For the queen, for the queen," and begging the citizens to arm themselves and join him. But though the hearts of the citizens were with Essex, and though they cried "God bless your honour!" the manifest inadequacy of his force made them irresolute, and after galloping about the streets for some time, without obtaining any fresh adherents, and until many of those who at first joined him had dropped off, he resolved to make the nearest way back to his own house. But on returning he found the streets barricaded with carts and other things, and at Ludgate experienced a check from an armed force placed there by the Bishop of London, from which, after a skirmish, in which the earl was twice shot through the hat, he was obliged to turn back, and at length reached Essex House by water. A large force now assembled without the walls, and it was evident that it would be impossible to hold out the house against the artillery brought to bear upon it; Essex therefore held a parley about ten o'clock at night, and then surrendered to the lord admiral, upon a promise of a fair hearing and a speedy trial. The latter he obtained, but his case was not one of those destined to be excepted from the general complaint made on state trials. He was found guilty of high treason, and privately executed in the Tower, February 25, 1600, being then only in his thirty-third year.

"It is impossible not to be interested in a man so brave, high-spirited, and generous: for a man who, while he conducted himself towards his sovereign with a boldness such as was then found in no other subject, conducted himself towards his dependants with a delicacy such as has rarely been found in any other patron." "He was a most accomplished person," says Camden, "and had all those good qualities in perfection that became a nobleman. . . . But he was a person not rightly calculated for a court, as being not easily brought to any mean compliances. He was of a temper that would readily kindle an injury, but would not so easily forget one; and so far was he from being capable of dissembling a resentment, that he carried his passions in his forehead, and the friend or the enemy was easily read in his face."

Whether the favours conferred on Essex by Elizabeth were prompted by friendship or by a more exalted feeling, has frequently been debated.

That the queen felt a more tender regard for him than his merits or the worthiness of his actions would have been alone capable of producing, seems sufficiently evident. Her frequent expressions of esteem; the great favours heaped upon him, "without desert," as she herself confesses; her solicitude for his health, going often to see him when ill, remaining for some time seated by his bed, "and ordering his broth and things;" the patience with which she bore his wayward fancies; and the ease with which she pardoned his frequent acts of disobedience to her commands, for which other persons would have for ever felt her resentment, must be sufficient to convince us that the feelings of the woman did in this case predominate over those of the queen.

The great objection that has been urged against these being considered proofs of affection, is the great disparity of their years, and especially the great age of the queen. Voltaire treats the whole supposition as a fallacy, and observes that "when her struggles about him must have been the greatest (the time of his death), she was sixty-eight; had he been sixty-eight it is probable she would not have been in love with him." That the latter remark is just we shall not attempt to deny, but surely the fact that he was young, handsome, graceful, learned, brave, and ingenuous does not lessen the probability that he should be agreeable to the queen; who, when he first came to court, was only a year or two beyond fifty, and wearing her age well. It it not attempted to be proved that he was devoted to the queen's person, and it is perhaps sufficiently apparent that he did not consider her majesty's affection would lead her to offer him a share of the throne, or he would scarcely have put so great an obstacle in the way as his marriage with the widow of Sir P. Sydney.

His quarrel with Sir Charles Blount did not arise from the jealousy of love, but the jealousy of ambition; and after the duel they lived on the most intimate and friendly terms.

It has been matter of astonishment to those who have supposed the queen to have been in love with her favourite, —and one of the proofs urged by others who maintain the contrary,—that she should have allowed the earl to have suffered for an offence which was so manifestly the act of a man irritated to a degree of madness by the injuries he had sustained, and which was never intended to injure her in body or estate. But Elizabeth, though she affected at times to be only a queen, was a woman in her heart, and the fall of the earl may have been owing more to his having offended her woman's pride than to the act of treason for which he was brought to trial. Should we expect a man to be quietly forgiven by a lady who should turn his back on her with scorn and contempt. What lover would not forfeit his mistress's favour, even were she really getting advanced in years, who should say of her that "she grew old and cankered, and that her mind was become as crooked as her carcass?" Are we then surprised to find that Elizabeth, accustomed all her life to the adulation of her courtiers, and addressed to the day of her death with complimentary epithets due to a maiden in her teens, should discontinue her regard for one who treated her so haughtily and with such contempt?

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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DAMASCUS.

[View of Damascus.—From Laborde's 'Syria.']

THE city of Damascus has latterly become invested with a new and painful interest occasioned by a persecution against the Jews residing there, and the infliction of cruel tortures upon them, always repugnant to our national feelings and principles. Into the details of this persecution the plan of our work does not permit us to enter, at least while the facts themselves are yet matters of controversy; and we therefore confine ourselves to giving a view and an account of this beautiful and ancient Eastern city.

Damascus is a city of Syria, and the capital of an important Pashalik of Asiatic Turkey. It is situated in a fertile plain at the east base of the Antilibanus ridge, about one hundred and eighty miles south by west of Aleppo, in 33° 27′ N. lat., and 36° 25′ E. long. It is one of the most ancient towns in the world, being mentioned as existing in the time of Abraham. (*Genesis*, xiv. and xv.) Its ancient name was Damesk, but the present natives call it Scham, which is also the name of Syria, and sometimes Scham Shereef, *i.e.* 'the noble.' It is one of the very few places which have maintained a flourishing existence in all ages. Though often taken and devastated, it has always risen again, and has always been mentioned as one of the most delightful situations in the world. It appears to have been in the time of David or of Solomon (1 *Kings*, xi. 24) the capital of an independent kingdom, which afterwards, under the name of the kingdom of Syria, was engaged in wars with the Jews. It was subsequently annexed to the empire of Assyria, afterwards to that of Persia; it then fell into the hands of the Macedonians, the Romans, and lastly of the Arabians, A.D. 634, when it was taken by the lieutenants of the caliph Abu-bekr, after the defeat of the forces of the emperor Heraclius in its neighbourhood. It became for a time the residence of the caliphs, and after other vicissitudes was taken by the Turks under Sultan Selim. In the late war between the Porte and Mehemet Ali, pasha of Egypt, Damascus was taken by the troops of the latter, to whom it was formally ceded by the sultan by the peace of 1833. The Pashalik of Damascus extends from north to south, from Hamah on the Orontes down to the deserts of Arabia Petræa, south-east of the Dead Sea, a length of about four degrees of latitude; and it comprehends the country of Haouran, and the other districts on the east side of the Jordan and the Dead Sea, besides the greater part of Judæa west of the Jordan, including Jerusalem and Nablous. To the east it is bounded by deserts which divide it from the valley of the Euphrates, to the north by the Pashalik of Aleppo, and to the west by the Pashalik of Acre.

The view of Damascus from the neighbouring mountain of Saleyeh, an offset of the Antilibanus to the north-west of the city, is very impressive; it comprises the town, with its numerous domes and minarets, the extensive woods, orchards, and gardens with which it is surrounded, clothed in perpetual verdure of various hues,

and beyond it the vast level plain stretching to the east farther than the eye can reach, and bounded to the south-east by the distant mountains of Haouran. The river Barrady and other streams descending from the mountains furnish the city and the plain of Damascus with a constant supply of water, which is distributed into numerous canals for irrigation, and is the main cause of the extraordinary fertility of the country. The town is about six miles in circumference, is surrounded by old brick walls falling to ruin in several places, and is said to contain, according to Buckingham and Richardson, about one hundred and fifty thousand inhabitants; but according to others above two hundred thousand, of whom twelve thousand are Christians, and about as many Jews. The rest are Mohammedan Syrians, Arabs, and Turks. The native Mohammedans have long had the reputation of being the most fanatical and intolerant in Turkey; but Dr. Richardson's account of them, and the reception which he and the rest of Lord Belmore's party met with, does not confirm this bad report of the Damascenes. (Richardson's *Travels along the Mediterranean and parts adjacent, in company with the Earl of Belmore, in* 1816-18.)

Seetzen, who visited Damascus in 1806, gave also rather a favourable account of the inhabitants. There is a Franciscan convent long established in the city, and the Greek patriarch of the church of Antioch usually resides there. When Dr. Richardson visited Damascus, Lord and Lady Belmore lodged at the French consul's, who appeared to live in perfect comfort and security in the midst of this fanatical population. A frightful insurrection, however, took place some years after, ostensibly on the news of an English consul coming to reside in the city, but the real source of the tumult appears to have been a long-brooding discontent at the weak and oppressive rule of the Porte and its pashas. Since that time, the pasha of Egypt and his son Ibrahim have enforced strict order and rational tolerance in Damascus, and the English consul-general and English merchants, in their Frank costume, live in and walk about the town in perfect safety. (Dr. Hogg, *Visit to Jerusalem, Alexandria, and Damascus*, 2 vols. 8vo., 1835; Michaud et Poujulat, *Correspondence d'Orient*, 1833-35.) M. Poujoulat himself, who was much alarmed on entering the gates at hearing some fellow proposing to burn him as a Frank, yet honestly says, "I could cite evidence greatly in favour of the Damascene Mussulmans. A Greek Catholic, who has had commercial relations with them for years, told me that he never had occasion to complain of them. I myself have frequently met Mussulmans in Christian houses, who treated me with great kindness. I cannot speak of the lower orders and the population of the suburbs, who probably resemble the same classes in most great cities."* The same writer gives the following statistical list:—"They reckon at Damascus one hundred and twenty-nine tanners' shops, twenty-two establishments for printing stuffs, seventy-five dyers of stuffs, one hundred and twenty dyers of silk, thirty-four houses of silk-winders, seven hundred and forty-eight merchants of damask cloth, two hundred and eleven grocers, sixty-eight tobacco manufacturers, seventy-two saddlers, eleven tent-merchants, forty-seven copper-smiths, fifty ironmongers, fifty-four farriers, seventy fur-merchants, ninety-eight laccmen, twenty-four corn-merchants, one hundred and forty-eight bakers, fifty-eight millers, one hundred and twenty-two coffee-houses, thirty-two confectioners, fifty-nine public baths, one hundred and twenty-nine butchers, seventy-one tailors, forty-three shops for pipes, six watchmakers, two hundred haberdashers' stores, four glass-manufactories, nineteen armourers, four soap-factories, one hundred and forty-three weavers, and more than four hundred public cooks." The manufacture of Damascus blades, once so famous, has declined long since: but good sabres are still made. Saddles and bridles, both rich and highly finished; fine cabinet-work, inlaid with ivory and mother-of-pearl, and rich jewellery, are among the articles of Damascene industry. "The shopkeepers of Damascus," says Dr. Richardson, "are generally clean and well-dressed, very comfortable in their appearance, and extremely civil to strangers. The bazaars are better lighted, and have a more elegant appearance than those of Cairo or Constantinople. Every class of commodities has its own street or bazaar: in one they sell nothing but shoes, another is occupied by the goldsmiths," &c. The town is well supplied with ice; and ice-water, mixed with the juice of figs or currants, is sold and drank in profusion. The best coffee-houses of Damascus are situated in the skirts of the town, on the edge of that branch of the river Barrady which supplies the gardens; they are built of wood, and are cool and well shaded from the sun, which is their chief attraction. The streets are narrow, and many of them have a gloomy dilapidated appearance, being lined by dead brick-walls, with small mean-looking doors here and there, which open into the courts of the respective houses, which are not seen from the streets. Many of these houses are splendid in the interior, the courts being paved with marble and refreshed by fountains, with arcades and divans around. There are no carriages at Damascus, and but few carts; camels, horses, mules, and donkeys constituting the means of carriage or conveyance. The great khan is a sumptuous building, the masonry being formed of alternate layers of black and white marble, like the Florence cathedral. The spacious square court within has a handsome fountain in the middle, and is surrounded by a fine arcade of pointed arches enriched with mouldings. On the ground-floor are the entrances to chambers and magazines, and a staircase and gallery lead to another series of apartments above. The principal mosque is also a fine building: it was originally a Christian temple of the Corinthian order, said to have been built by the emperor Heraclius. There is also an extensive citadel.

Beiroot is considered as the port of Damascus. The exports from Damascus are chiefly raw silk, galls, madder, gums, opium, and dried fruit; but Damascus is also a great place of depôt and market of goods both from India and from Europe. The great Hadji caravan goes every year from Damascus to Mecca. Other caravans proceed to Aleppo, to Hit on the Euphrates, and thence to Bagdad. From Damascus to Hit is about eleven caravan days.

Coin of Damascus. Imperial Greek.
British Museum. Actual size. Copper. Weight, 217½ grains.

DOMESTIC CHEMISTRY.—No. VII.

A CANDLE.

[Continued from No. 541.]

IF a candle were brought among us for the first time, and its action were described to us upon scientific principles, we should call it, what it certainly is, an admirable invention; but by seeing candles so constantly about us, and using them so much as a matter of course, we fail to notice their excellent adaptation to our wants, both as to cheapness, portability, and general convenience. Having in some former articles described the nature of lamps, gas-lights, &c., we now purpose to inquire, first, into the

* The recent events, however, notwithstanding the favourable opinion of modern travellers, seem to confirm the older opinions as to the fanatical character of the inhabitants.

mechanism, and secondly, into the philosophy of a candle.

Candles are formed either by being dipped or moulded, and the tallow of which they are generally made is sorted for the purpose of the manufacture, mutton-suet, mixed with ox-tallow, being chosen for mould candles, as making them hard and glossy; and coarse tallow alone being used for dips. After sorting, the tallow is melted in an open vessel by means of a gentle heat; and the membranous substances in which the fat was contained in the animal, gradually collect at the surface, and are removed. When these membranous substances are collected in sufficient quantity, they are subjected to the action of a press, whereby the fat is forced out, and a solid cake (called cracklings or graves) is formed: this is sold by the tallow-chandlers as food for dogs. The melted tallow is removed from the first copper, and passed through a sieve into a second, where it is cleansed with boiling water: in a short time the impurities sink to the bottom; and the purified tallow, floating on the surface of the water, is taken out and stored in tubs.

Dr. Ure says:—"It is a remarkable circumstance that the wicks for the best candles are still cotton rovings imported from Turkey, notwithstanding the vast extension and perfection of cotton-spinning in this country." The cotton is generally formed into balls; and the wick-maker takes a thread from each of four, five, or six balls, according to the thickness of the wick required, and cuts them by means of the following simple apparatus:—a smooth board, placed on the knees, has on its upper surface the blade of a razor or sharp knife; and at a distance corresponding with the required length of the wick, a piece of cane is fixed, round which the cotton is carried; and being thence brought over the edge of the razor, is instantly separated. The cotton is next 'pulled,' that is, the threads are made smooth and even, and knots are removed. The next operation, when dips are required, is to 'spread' the cotton, by placing it on rods called broaches, about half an inch in diameter. When the tallow is melted and properly skimmed, the workman holds two or three of these broaches between his fingers, and dips the wicks into the melted tallow; these are then hung up until the tallow has solidified, during which time others are dipped: in this way the wicks are dipped several times, until the candles are of a proper size. The tallow is kept to the proper temperature by means of a small charcoal fire.

A modern invention, due, we believe, to Mr. Maudsley, has greatly economised the time and diminished the labour of the tallow-chandler, and has almost superseded the dipping of candles by hand. Five or six of the broaches, with the cotton wicks arranged upon them, are fixed in a moveable frame, which is suspended over the vat of melted tallow upon one extremity of a lever, and counterbalanced at the other end by weights. By this plan the workman has only to guide the frame in dipping the candles: another great advantage is, that those candles which are sold at one price can always be manufactured of precisely the same weight; whereas in hand-dipping, neither the seller nor the consumer can rely on the weight of the candles. The dipping apparatus requires a constant change of the sets of broaches after each set has been dipped. By an ingenious variation recently introduced, twelve frames are suspended from the ends of six levers working in a strong upright post turning on iron pivots: by turning this post round, each frame in succession comes over the melted tallow, and is gently pressed downwards, by which means the wicks are immersed in the tallow; and as the arms of the levers are all of the same length, and as the candles at the opposite ends balance each other, the levers naturally tend to assume a horizontal position, an object aided by other ingenious contrivances. In this arrangement each frame contains six broaches, and on each broach are hung eighteen wicks, making the number of wicks on the whole twelve frames twelve hundred and ninety-six; and if, as is generally the case in moderately cool weather, six sets of candles can be completed in one day by one workman, we thus get the large number of seven thousand seven hundred and seventy-six made in that period.

Mould candles are usually formed in pewter moulds, consisting of two parts soldered together, viz., a hollow cylinder, finely polished on the interior, and a small metallic cap with a hole for the wick. Eight or twelve of these moulds, according to the size, are fixed in a wooden frame, the upper part of which forms a sort of trough. The caps of the moulds point downwards, and the other ends are made quite level with the upper surface of the trough. The frame is laid on one side; a hooked wire is passed along the cylinder of each mould and out at the wick-hole; and to this hook the looped end of the wick is attached, and so drawn in. A small wire is passed through the loop of each wick for the purpose of keeping it stretched in the centre of the mould. The workman now allows melted tallow to flow into the trough; and when the moulds are nearly half filled, he stops the flow of tallow; and, laying hold of that part of the wick which is out of the mould, pulls it tight, and thus prevents it from curling. The process of filling is then completed; the frame is set aside to cool; and when cool, he withdraws the wires which kept the wicks stretched. The tallow on the top of the frame is removed by means of a wooden spade, a bodkin is inserted into the loop of the wick, and each candle is thus withdrawn from the mould. The candles, after having been inspected by the excise-man, are removed to the storehouse and kept for some months, during which time they become nearly white. Some candle-makers, who cannot keep a large stock by them, bleach them by exposing them to the air and the dews for several days.

Wax candles are made by 'hand,' or by the 'ladle.' In the one case the wax is kept soft by means of hot-water, and applied by bits to a wick, which is suspended from a ring: in the other case the wicks are suspended round an iron circle placed over a vessel of melted wax, which, by means of a ladle, is poured over the tops of the wicks. When the candles have acquired a proper size, they are rolled upon a table of walnut-tree wood by means of a long smooth piece of box-wood, moistened with hot-water to prevent the adhesion of the wax. Wax tapers are made partly by rolling and partly by drawing: by means of two large wooden rollers, the wick is passed several times through melted wax contained in a vessel: this vessel is furnished on one side with an instrument full of holes, through which the cylinder of wax is made to pass; and thus, after the manner of wire-drawing, it is brought to the required size.

Various experiments have been made by Gay-Lussac, Chevreul, and other chemists, with the object of improving the materials and the manufacture of candles; but as these experiments are as yet rather an object of interest to the man of science than to the general reader, we will pass them over, and proceed to give a few details respecting the combustion of candles.

Under all ordinary circumstances, the atmospheric air is necessary to the production and maintenance of flame; and a candle, burning in a confined portion of air, becomes in a few seconds extinguished. But when a constant supply is provided, the flame of a candle is maintained by the following means:—The lighted candle being introduced into a room, produces currents of air which move towards it, become heated, and ascend. If the air could be kept perfectly still, the form of the flame would be globular, because the air would press equally in all directions; but being set in motion by the heat of the flame, the pressure is greatest at the lowest part, and diminishes upwards in the immediate vicinity of the flame, the conical form of which is the consequence of this unequal pressure.

When a candle is first lighted, it burns dimly; but in a short time the tallow immediately below the wick, influenced by the heat, melts, and is drawn up into the wick by capillary attraction, that is, the interstices between the fibres of the wick furnish a series of minute tubes, up which the melted tallow ascends. Although wax, tallow, and oil are combustible substances, yet, before combustion can take place, not only must the substances be melted, but they must also be raised to such a temperature as to produce vapour, which vapour ignites to form flame. If we hold a piece of lighted paper to the surface of oil or melted tallow, we shall fail to produce ignition; but when the oil is divided into minute filaments by means of the wick, these filaments become more readily converted into vapour and ignited. The wick of the candle, however black and devoid of heat it may appear, is in fact excessively hot: it does not appear red-hot, because the air cannot get to it; but if we suddenly blow out the flame, the wick immediately begins to glow, and to emit clouds of very disagreeable vapour of tallow, which may easily be rekindled. Hence the use of an extinguisher in putting out a candle: this instrument, by fitting close to the top of the candle, confines the vapour, prevents the noisome odour from being diffused, and puts an end to combustion by cutting off all supply of air.

There is something worthy of admiration in the economical method by which the flame of a candle constantly supplies itself with fuel, in quantity neither more nor less than it requires. If it drew up a larger supply than it could consume, the candle would smoke: this is the case with badly made candles, or where the flame is exposed to a current of wind: if it drew up a less supply than was necessary for its wants, the flame would be dim. The proper supply is furnished by the peculiar form given by the flame to the tallow immediately below it: the tallow below the flame is formed into a little cup, on account of the action of the flame being more powerful upon the tallow near the wick than upon that at the exterior: the edge is kept cool by the constantly ascending current of air, and thus forms a little cup containing melted tallow in the middle near the wick. If by an awkward use of the snuffers we injure the edge of this cup, the melted tallow, instead of ascending to the flame, 'gutters' down the candle, and the light is diminished. So also if the wick within the flame becomes too long for want of snuffing, the candle gutters, because more tallow is melted than the flame can consume; the cup becomes too full, and then overflows. Here, too, we see the reason why the branches of a chandelier are not placed over one another; for if they were so placed, the hot air from the lower circle of candles would melt the wax or tallow of the candles of the upper circle, and make them burn badly; indeed, as it is, the upper circle or circles of candles never burn so well as the lower; and in hot and crowded rooms, it may frequently be noticed that the candles gutter and burn badly, on account of the ascending currents of over-heated air.

Besides the properties of the flame of the candle to which we have alluded, there are others to which attention may be directed. Flame is opaque, that is, we cannot see through it as we can through glass and other substances which transmit light: to prove this, if we place the finger behind the flame of a candle, and look steadily at the flame with one eye, the finger will be as effectually concealed as by a deal board. Flame is also hollow—a mere shell, luminous on the exterior and dark within: this shell or bubble is filled with hot inflammable vapour of tallow, rendered so by the high temperature to which the tallow is exposed. That this central vapour, though unignited, is inflammable, may be shown by taking a small tube, and inserting one end exactly in the centre of the flame: vapour will ascend the tube, and may be kindled at the upper extremity. The hot vapour within the flame is constantly ascending with it; and in the act of doing so, successive portions of it are brought to the exterior, where combustion is going on. The vapour is decomposed, its hydrogen affording the flame, and its carbon, in a minutely divided state, rendering the flame luminous: in the act of combustion the hydrogen combines with the oxygen of the air, and forms vapour of water; and the carbon unites with another portion of oxygen to form carbonic acid. Thus it will be seen that the combustion of a candle is a beautiful chemical process: nothing is lost; but tallow and cotton are converted into water and carbonic acid, the weight of the two latter nearly equalling that of the two former; and it is the very act of effecting this chemical change which produces the light and heat for which flame is so much desired.

Power of Adaptation of Habits in Animals.—In truth the power which animals as well as men possess, of conforming themselves to new situations and forming new habits adapted to new circumstances, is proof of a capability of improvement. The wild dogs in the plains of La Plata burrow, because there is no security for them above-ground against stronger beasts of prey. In the same country owls make their nests in the ground, because there are neither trees nor buildings to afford them concealment. A clergyman in Iceland by sowing Angelica upon a lake island some miles from the sea, not only attracted gulls and wild ducks to breed there, but brought about an alliance between those birds, who are not upon neighbourly terms elsewhere. Both perceived that the new plants afforded better shelter from wind and rain than anything which they had seen before; there was room enough for both; and neighbourhood produced so much good-will, that the gulls protected the weaker birds not only against the ravens, who are common enemies, but against another species of gull also which attacks the duck's nest. A change more remarkable than either of these, is that which the common heath-cricket has undergone in its very constitution as well as in all its ways of life, since men built houses and inhabited cold climates. The field-cricket in North-America, which buries itself during the winter ten inches deep and there lies torpid, began about an hundred years ago to avail itself of the work of man and take up its abode in the chimneys. This insect even likes man for a bed-fellow, not with any such felonious intentions as are put in execution by smaller and viler vermin, but for the sake of the warmth. The Swedish traveller Kalm says that when he and his companions were forced to sleep in uninhabited places, the crickets got into the folds of their garments, so that they were obliged to make some tarriance every morning, and search carefully before they could get rid of them. Two species of swallows have domesticated themselves with man. We have only that which builds under the eaves in England, but in North America they have both the house-swallow and the chimney-swallow; the chimneys not being made use of in summer, they take possession, and keep it sometimes in spite of the smoke, if the fire is not very great. Each feather in this bird's tail ends in a stiff point, like the end of an awl; they apply the tail to the side of the wall, and it assists in keeping them up, while they hold on with their feet. "They make a great thundering noise all day long by flying up and down in the chimneys:" now as the Indians had not so much as a hearth made of masonry, it is an obvious question, says Kalm, where did these swallows build before the Europeans came, and erected houses with chimneys? Probably, it is supposed, in hollow trees, but certainly where they could; and it is thus shown that they took the first opportunity of improving their own condition. A dog may be made an epicure as well as his master. He acquires notions of rank and respectability; understands that the aristocracy are his friends, regards the beggar as his rival for bones, and knows that whoever approaches in darkness is to be suspected for his intentions. A dog's physiognomical discernment never deceives him; and this the Doctor was fond of observing, because wherever he was known the dogs came to return the greeting they expected. He has a sense of right and wrong as far as he has been taught; a sense of honour and of duty, from which his master might sometimes take a lesson; and not unfrequently a depth and heroism of affection, which the Doctor verily believed would have its reward in a better world.—*The Doctor.*

BUKHAREST, AND THE COUNTRIES OF WALLACHIA AND MOLDAVIA.—No. I.

[Bukharest Metropolitan Church and Bell.]

Bukharest, or the 'City of Enjoyment,' for that is the meaning of its appellation, is in the eastern part of Wallachia, of which it is the capital, and agreeably situated in a rich and spacious plain diversified by hills, on the eastern bank of the river Dumbovitza, which flows into the Danube. Seen from one of the neighbouring eminences, Bukharest appears to extend itself to the very range of the horizon; and standing as it does in the midst of countless gardens, it really does cover an immense extent of ground. Its general aspect is very picturesque, from the mixture of its roofs of all colours, from the appearance of the towers rising from above sixty churches, and from the verdure which every here and there appears through the mass of buildings. The interior of the city presents a very different appearance. The greater part of the houses are only little barracks of rotten wood, from among which rise the chief architectural edifices; the streets are of unequal size, badly laid out, and either altogether unpaved, or merely faced with trunks of oaks; and many even of the superior houses of the boyards, or nobles of the country, owing to the unfitness of the materials to resist the climate, present a very dilapidated aspect, which not all their profusion of roses and other flowers can conceal. The shops are numerous and tolerably well furnished; and one entire quarter is filled with the warehouses of the furriers and the workshops of the tailors. The place is also full of coffee-houses, having generally a billiard or gambling table attached, and of shops for the sale of sherbet and wine. Among the principal edifices we may mention the Prince's Palace, a vast old pile, and the Metropolitan Church, of which an engraving is given at the head of this article. Both are situated in a large square, on a hill in the centre of the town, and enjoy therefore a very commanding site. This, like many of the other churches, is surrounded by extensive cloisters; the entrance is between two massive gates surmounted by towers. There are three steeples to the church, of a very elegant character, the domes of which, as well as the roof of the sacred edifice, are of metal, painted green. The entire surface of the structure is covered with a white and brilliant stucco. In front of the façade extends a peristyle adorned in the interior with a profusion of paintings. The nave is narrow, full of gildings, and sculptured and other representations; and the wall of the chancel highly enriched with ornaments. Beneath the vaulted roof of the latter the exterior light penetrates with great difficulty, the windows, though long, being extremely narrow. Besides this church, there are in Bukharest sixty-four others; of which we need only observe that they have all steeples, some as many as six each, and others nine, and that their architecture generally is of a very uncouth kind. The hall in which the General Assembly, or house of representatives for the province, holds its deliberations, is, like that of the diet of Hungary, remarkable for its extreme simplicity. It is long and narrow; at one extremity is elevated under a canopy the seat of the archbishop of the see, who is the permanent and legal president. The appearance of the hall when the members are in deliberation is interesting. The boyards preserve in their dress the full and majestic Turkish costume, while those who hold military offices appear in their uniforms, with sabres at their sides. A part of the hall is reserved for spectators. The museum is specially devoted to the collection of materials for the study of natural history; it is not at present very large, but appears to be increasing. A public library has been founded in the same locality, which contains seven thousand volumes. There is a college for education, with commodious lodgings for the pupils: the dress worn is very pretty. The military hospital is established in a building not originally intended for that purpose, and consequently the site is by no means so favourable as might be wished. The patients are numerous through the fevers common to the country, but the effects of which have been greatly lessened by the precautions introduced of late in connection with the diet of the soldiers. Another hospital has been built by subscription on the borders of the city, which presents a noble suite of

halls, through which the air and light, so cheering to the mind and so beneficial to the body, penetrate freely. Among the other public buildings we may mention a large bazaar, a Catholic church, a Lutheran church, a synagogue, and the residence of the Austrian consul, a handsome edifice. In the middle of Bukharest is a tower called the 'fire-tower,' sixty feet in height, and from the top of which is obtained an excellent view of the city. A corso, or public mall, extending along the main street and the bridge which crosses the Dumbovitza, is much frequented by the fashionables of the city. Two Journals are published in the city; there is a Society of Belles Lettres, a school of arts and trades for the soldiers, and an agricultural society. Bukharest is the great commercial mart of the principality, and, the neighbouring country being exceedingly fertile, enjoys a considerable trade in grain, wool, honey, wax, tallow, and cattle. There are altogether ten distinct havens, of these the most frequented is called the Sherban-Wode. There are no large manufactories, but woollen cloths, carpets and brandy are produced, each to a trifling amount. Before the political commotions which have so cruelly injured the prosperity of the country, and of which we shall speak in a future article, Bukharest contained sixty thousand inhabitants. During the period we have alluded to, this number sank to fifty thousand. It is satisfactory to find that the population is now again fully as numerous as ever: according to the very interesting and valuable work of M. Démidoff* (to which we are glad to acknowledge our obligations for much of the materials of this and the following papers), the amount in 1837 was sixty thousand seven hundred and eighty-eight. The number of houses at the same period was ten thousand and seventy-four, and of monasteries twenty-six.

The habitual food of the people consists of boiled messes of flour, maize, or millet; the use of meat or salt fish is hardly known among them. Their principal fermented liquor is brandy made from plums. They are fond of outward display, and of public festivities, music, dancing, &c. "That which astonishes us the most," remarks M. Démidoff, "is the variety of costumes and figures which pass every instant before us, as the types of the numerous population. The people generally walk the city with a spruce business-like air which one would not expect in the dwellers in an Eastern city. The artisans, the labourers, the porters with their heavy loads, do not appear to dread work. But that which above all animates the city is the number of inhabitant Jews. Active, insinuating, and never discouraged, they heed not distance or fatigue whilst there is a hope of the slightest recompense. So when you perceive the large-brimmed hat and black robe of a Jew, you may address yourself boldly to that man to do for you whatever you desire to be done. He will answer you in German, in Italian, or in one or two more foreign languages perhaps, and for some piastres devotes himself to your service. His industry, his nimbleness, his silence, his patience, his eloquence, his virtues, his vices, his soul, his body, all are yours. And if for a momentary commission you have employed an Israelite, believe not that you will easily get rid of him. He is yours henceforward, or rather you are his. He will follow you twenty times backwards and forwards in the street—he will sit himself down upon the threshold of the door where you are going to enter—and there you again find him as you go out, slyly but respectfully by his looks soliciting an order. He lies down upon your stairs, under your carriage, makes himself the servant of your attendants, salutes your dog in the streets—wherever you move, he is there—always there: you have twenty times thrust him by with rude blows, but he persists still, and always. At length comes a day, an hour, a caprice—you would have the Jew! Hardly have you formed the thought, and he stands before you. And there, cringing in his humility, in a posture neither standing upright nor quite prostrate, with a subdued air and attentive ears—the Jew enjoys his triumph! That is the instant he has often achieved by forty-eight hours of watchfulness, fatigue, and humiliation. Hardly have you spoken, before you are obeyed, and that with punctuality, delicacy, and respect; and when, after so much care and self-denial, the poor bearded messenger touches at length his dearly earned recompense, for which perhaps he has been your valet these two days, you see in his grateful look that he is recommending you to all the favours of Abraham and Isaac, and that he is quite ready again to give himself the same trouble for a similar recompense."

* 'Voyage dans la Russie Méridionale et la Crimée,' &c., Paris, 1840.

SKETCHES OF THE COASTS FROM SINGAPORE TO PEKIN.

IX.—FROM SHANGHAI TO PEKIN.

[Concluded from No. 539.]

SHANGHAI (the emporium of Nanking) is the first town of any importance on the coast of Kiangnan province. It stands on the banks of a considerable river called Woosung, the broadness of whose mouth would seem to promise ample shelter to any number of ships of whatever size. But the extreme uncertainty of the soundings, and the limited knowledge which, in the absence of any chart that could be rendered available for practical purposes, is possessed by our seamen of the tides and currents, preclude at present the possibility of the safe entrance of any large vessels within its bar. If, however, these difficulties were surmounted, and suitable precautions taken against existing dangers, the embouchure of this river would be one of the most eligible points for the establishment of British commerce in the whole empire. Be this as it may, however, certain it is that even now Shanghai carries on the greatest native trade of any port on the coast. Thousands of junks sail yearly to Manchow Tartary loaded with all the most precious products of the provincial manufactories, and return with cargoes of peas and medicinal drugs. Besides these, several vessels, owned by Fo-kien merchants, carry on a profitable intercourse with the islands of the Indian Archipelago.

Emerging from the intricate passages of the Chusan group, a lofty insulated peak named Seu-kung-shan serves as a landmark to direct the ships on their way to the Woo-sung river. No other indication of land is for a long time visible. Nought but a restless shallow sea, ever rolling and sparkling in the sun—either flowing outward in obedience to the strong current of the Sang-tseu-kiang, or impelled inward by the tide. If a favourable wind be denied, ships find a safe anchorage near the above-mentioned island; and here at such times whole fleets of junks are to be found.

In spite of our neighbourhood to the shore, we are yet difficult to be persuaded of its vicinity. The shores on all sides stretch away so nearly on an equality with the water, that they are invisible until you are almost upon them. Presently, however, a few groves of trees attract attention to the mainland. Steering then in a north-western direction, a day or two's sailing brings us from Seu-kung-shan to the mouth of the river, marked by two forts, opposite which, on one side, the water is six fathoms deep, whilst on the other it shoals, so as to leave only a channel for the passage of vessels.

The city of Shanghai is built on the left bank, some distance from the mouth. It is laid out with sufficient elegance, and possesses numerous temples. The houses are in general neat and comfortable, whilst the inhabitants are described as a polished but servile race of people; and in truth, polish in the subjects of a despotism is but a refined species of servility. The country around offers

nothing worthy of description, consisting of continual fields of rice spreading in unvarying vegetation on all sides, diversified only by the sparkling waters of a few rivers and canals, one of which serves as the nearest communication with Nanking.

Proceeding, however, from this emporium still northward, we pass, between the island Tsong-ming and the mainland, into the entrance of the great river Sang-tseu-kiang-keou. The scenery still maintains the same characteristics, and the broad expanse of waters is only relieved by the few sails and the yellow shoals which sparkle here and there when left uncovered by the tide. The approach, indeed, from hence to Nanking is so difficult in consequence of these shoals, that the commerce of that once extensive city suffered probably as much from this cause as from the removal of the imperial court to the northern capital. It has been supposed that the Chinese could remedy the evil, and the reason attributed to them for not attempting it is, that they wish rather to encourage inland than distant commerce. It is likely, however, that considerations of expense have had considerable influence in deterring them from this vast attempt, and it may be that some politic Chinese has endeavoured to exculpate his countrymen from the charge of parsimony by a pretence which does as much honour to his ingenuity as it would reflect contempt on his government if the assertion were founded in fact.

The island of Tsong-ming, which lies on the southern side of the entrance into the bay of the great river, is ninety miles in length, and in breadth about twenty. Originally it was a sandy plain covered with jungle and reeds, used only as a penal settlement by the Chinese. The robbers and vagabonds banished thither, anxious to ameliorate their condition by degrees, cleared small patches of ground, and converted the wilderness into a garden. Other families, attracted by reports of the fertility of the soil, soon arrived and mingled with the colony. The island was divided into a number of hereditary estates, for which a small rent is paid to the descendants of the first settlers; and the place now abounds in the grains common in China, and is particularly remarkable for the fine fruits, especially peaches, which are there grown.

Not far from the mouth the great river is divided into two channels by the Golden Island, so called on account of its excessive beauty. Its hills are clothed in green, and adorned with thickets of sweet-smelling shrubs, whilst on the summits appear the elegant temples of the Buddhists, or followers of Fo. But let us not be tempted by the curious interest of the subject to penetrate farther towards the fast decaying capital of China. Our plan confines us at present to the sea-coast, which, however, here refuses to lend itself to the ornaments of a picturesque description. The same extensive flats, the same green plains divided from the waves by a pebbly belt, the same lazy swells weary the eye of the coasting sailor, until he approaches the waters stained and troubled by the rapid and muddy Hoang-ho. This river flowing, it is supposed, in an artificial channel, and kept only from resuming its ancient bed by immense labour and waste of treasure, comes down, after a circuitous route from Thibet, loaded with a yellow mud, which is borne out so far into the neighbouring sea as fully to justify the appellation which has been bestowed upon it of the Yellow Sea. In fact ships sailing in these waters leave a wake behind them of a deep ochreous hue, receiving this unusually dark colour from the mud which is disturbed by them as they move.

Not far beyond the Hoang-ho commences the little known and little frequented coast of Shantung, which, however, unlike the interior, begins to resume the characteristics of the southern shores of China. Rough headlands and bold rocks again make their appearance, until we reach the great promontory of Shantung, which is extremely craggy, and somewhat difficult to pass, especially as the weather is often excessively hazy and foggy. Wee-hai-wei, the first town of any importance to the north, was built, as is testified by an inscription in its neighbourhood, during the Ming dynasty, and repaired under Yung-la (1423). The male inhabitants are healthy and strong, but the women appear pale and languid. The fields are, as usual, sown with Barbadoes millet, wheat, onions, garlick, &c. The ploughs are often drawn by three animals, a cow, an ass, and a mule, which presents a sufficiently ludicrous appearance.

The city of Ki-san-seu, about eighty miles to the west of Alceste Island, is pleasantly situated, and the environs well cultivated. The people are wealthy, and of commercial habits, trading to a considerable extent with the junks that touch at the port in their way to and from Tien-sing. Among their manufactures a kind of cloth half cotton and half silk is worthy of notice. The people are fond of horsemanship, and probably the inhabitants are almost exclusively formed of descendants of the conquering Tartars, and retain this relic of their ancient habits. Even the ladies are ambitious of knowledge in horseflesh, and contend together in races to show off their skill. The bay of Ki-san-seu is very spacious, and contains two harbours; and the port of Ten-tcheou-foo (opposite the Mi-a-tau islands, and fifteen leagues to the west) is also a very fine one, and the city is garrisoned by a large force. There is likewise a fleet stationed here to guard the coast.

The islands of Mi-a-tau are populous and well cultivated, but their harbour does not afford a secure retreat on account of a dangerous reef of rocks that lies off the east end of the easternmost island, called Chan-san.

The coast is here generally rocky, and the inhabitants are very poor; for the country produces little except a few fruits. The houses are rough coustructions of granite roofed with sea-weed. Fish is plentiful, and very cheap; but the common food of the country is Barbadoes millet, which is ground in a mill worked by water, and is eaten like rice.

Beyond Ten-tcheou-foo the gulf retires towards the south, and forms a great bay, into which flow many rivers. The province of Shantung ceases, and that of Petchili commences at Tingching, a town of considerable extent, surrounded by a high wall. Here the coast presents a livelier aspect, and affords a seasonable relief from the naked and hungry rocks of Shantung. But beyond this town, and almost along the whole coast of Petchili, as far as the mouth of the Peiho, and a hundred and fifty miles farther, to the termination of the Great Wall and of the empire, the surface is so excessively low and flat that the tide flows more than a hundred miles from the mouth of the Peiho. The country,* therefore, as might have been expected, is subject to frequent inundations, which have been brought forward partly to account for the traditions prevailing in China, of Yu having carried off a great deluge in eight years by means of nine channels which he caused to be opened. As might be expected from the lowness of the land, the bed of the sea is here extremely shallow, so much so indeed, that when the north wind prevails, it drives the water back to such an extent that sailors have been known to wade about in search of crabs at the distance of thirty miles from the shore. On the contrary, when the southern wind blows, the waves, impelled forward over the low swampy plain, often lay the whole country under water.

The Peiho, which flows from the neighbourhood of Pekin by Tien-sing to the sea, is the only water-route

* The soil in this province is entirely composed of an argillaceous sand abounding in mica. Some geologists are of opinion that almost the whole of it has been formed by the alluvium carried thither by the streams from the neighbouring highlands. This soil, it is said, first collected at the foot of the mountains, and then gained upon the sea which washed them, and is now above a hundred miles distant in a straight line from the coast

from the Gulf of Petchili to the capital. It has at its mouth two forts, which are the first objects visible from the sea. As you approach, nought but dreariness appears. The rugged features of the coast, as we before remarked, had somewhat relaxed about the confines of the two provinces of Petchili and Shantung, but here an unvarying waste presents itself. Nothing relieves the eye but the two forts—square gaunt buildings; and farther inland, immense stacks of salt, and the numerous tumuli raised by the Chinese to commemorate their departed friends. The meandering course of the Peiho, bare of foliage, may be traced from the walls of the forts for many miles inland, together with the unbroken chain of wretched villages erected on its banks; for the inhabitants of these unpromising regions invariably congregate on the banks of some stream, that they may profit as much as possible from the commerce carried on upon it.

A short distance above the mouth occurs the small town called Ta-coo. The houses here are built almost solely with a view to protect the inmates from the cold, every other convenience being sacrificed to this purpose. High front walls without windows impart a deserted aspect to the streets, and entirely conceal the square dwarfed buildings behind them, which seem purposely depressed in order to offer as little surface as possible to the influence of the northern blasts which come, laden with snow and sleet during the winter, from the lofty table-lands of Tartary. The mandarins only can boast of brick buildings, the other inhabitants, however rich, being ensconsed in mud erections differing only in size from the miserable hovels of the poor, which have but one chamber, and that as low and as contracted as possible. In these dens, however, the population multiplies prodigiously, which increases the poverty of all by lowering the wages and heightening the price of provisions; and these provisions, far from being produced on the spot, have to be brought at great expense from other and distant provinces, so that were it not for the vicinity of the capital, this district would be utterly abandoned. As it is, deaths are frequent; and whole families, unable to pay the exorbitant price exacted for imported fuel, perish annually during the severe frosts of winter.

But as we proceed up the course of the river livelier prospects and more cheering landscapes present themselves to our view. Large fields of Barbadoes millet (twelve feet in height, and the tallest of the vegetable tribe), with pulse and turnips, continually attended by gaily dressed female labourers, begin to diversify the scene; and some romantic villas on the green banks of tributary streams, surrounded and adorned by gardens blushing in all the purple splendour of an Asiatic parterre, by vineyards, by shrubberies, and by groves of willow, cypress, juniper, and walnut-trees, charm the sight and revive the spirits, depressed as they had been by the dreary waste previously beheld on all sides. Indeed, but for some Oriental characteristics not to be mistaken, the narrowness of the roads, sometimes even the absence of footpaths, the lumbering nature of the vehicles which appear here and there drawn by asses, and the quaint and primitive plough to which several of the same grave animals are yoked—but for all this, we might almost imagine ourselves to be in Europe. The large Chinese characters, however, painted over the doors of the numerous wine-taverns, where various species of spirituous liquors are sold, although the grape is here never pressed, contribute to impart to the scene a foreign aspect.

When night sets in upon the voyager on this river, the crowding of the boats, the loud calls of the sailors, and often the sounds of drunken conflict, together with the constant flapping of the cicada, and the buzzing and stinging of the musquitoes, rarely allow him to taste of undisturbed repose. Three days, however, bring him to Tien-sing, which is built at the confluence of two rivers. Here handsome quays adorned with temples and the dwellings of the mandarins, vast yards and magazines for naval stores, extensive commercial establishments, warehouses, and gaily decked rows of shops, together with the long bridges of boats occasionally separating to allow a free passage, announce the most considerable town in this province next to Pekin. Tien-sing is even said to equal Canton in the constant bustle of its streets, and to surpass it in the importance of its native trade. The streets, however, are unpaved, and the houses, like the others towards the sea, are of mud. But within, the tastefulness of the ornaments and the elegance of the furniture bespeak a degree of affluence unknown in any of the villages or towns we have previously mentioned.

The trade of Tien-sing is, as we have said, very extensive. It is visited by more than five hundred junks from the southern ports of China, from Cochin-China, and Siam. Many of these vessels are annually shipwrecked on the coast, which considerably diminishes the profit that would otherwise accrue. From Corea also vast quantities of merchandise are annually exported to this province, not only their own manufactures, but the produce of Japan, the Philippine Islands, and even of Java. The exports of Asiatic Russia also find their way into China by the same channel, although this and all foreign commerce is strictly forbidden to the Coreans. The emperor even keeps a mandarin at the Corean court to see that his orders are observed, but little attention is paid notwithstanding to them. The intercourse with Russia is that most dreaded and most emphatically prohibited by the Chinese, who even affect to draw the maps of the intervening country wrong in order to keep their own subjects and those of Russia in ignorance. But this has no effect whatever on the Coreans, who trade up the Amur, and pretend, as Ysbrande Ides informs us, though he was not aware of the deception, to come from some distant island. They carry on commerce also with the Manchow Tartars, who connive at the disobedience, and furnish them with the vast quantities of furs which they bring to Tien-sing, pretending that they are the produce of their own peninsula.

The usual route taken to Pekin after you leave Tien-sing is by the northern river, which flows from Tong-tcheou-foo. During the whole of its course there are no solid bridges thrown over this stream, that commerce may not suffer by the obstruction. There are, however, some very fine ones of stone built over several of its tributaries.

Ninety miles above Tien-sing is the city of Tong-tcheou-foo, the landing-place for passengers to Pekin, which lies only twelve miles distant. But it is not at present our intention to accompany the reader thither. Our object in these sketches has been merely to describe the scenes which a coasting voyage throws within the range of a traveller's experience. We shall, therefore, here pause, fully persuaded at the same time, that it is no fault of the subject if these articles have not afforded both amusement and instruction to the reader.

We must learn to comprehend the essence of art from admiration of excellence, rather than from detection of error.—*Frederick Schlegel.*

Ability required for Instruction.—No mistake is more gross than that of imagining that undisciplined teachers are the fittest to deal with ignorance and mental rudeness. On the contrary, to force the rays of thought intelligibly through so opaque a medium, demands peculiarly and emphatically a great clearness and prominence of thinking, and an exact feeling of the effect of words to be chosen, combined, and varied.—*Foster*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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THE AGILE GIBBON.

[The Agile Gibbon, or Ungka Puti.]

THE Gibbons (genus Hylobates) constitute a peculiar and very interesting group of the quadrumanous animals, confined in the extent of their territorial range, as far as hitherto decidedly ascertained, to Assam, Siam, Malacca, Borneo, Java, and Sumatra. They are expressly formed for arboreal habits, and tenant the forests, being at home only among the branches of the loftiest trees; there they exhibit the most extraordinary feats of address and agility, throwing themselves from one bough to another with the utmost confidence and security. Their most immediate generic relationship is with the orang (Pithecus), but there are marked and essential differences which draw a definite line of separation between the genus to which they belong and that which includes the latter animal. Like the orang, the Gibbons are without tails, but instead of being covered with long coarse hairs falling in masses, they are clothed with deep crisped or woolly fur, and have small posterior callosities; the abdomen is small, and the hips are extremely narrow, but the chest is broad, and the muscles of the shoulders are greatly developed and possess amazing power. Like the orang they have the arms of immense length, the fingers touching the ground when the animals assume the erect attitude; and the lower limbs are short, and bowed in, the ankle having an inward bend. The hands and feet are admirably formed for clinging with tenacity to the branches; the fingers are long, but the thumb of the fore hands is short, slender, and separated; that of the hind hands, or feet, is very large and powerful; the head is small and of an oval figure, and the face is depressed; the expression of the countenance being grave, gentle, and rather melancholy. All utter loud cries, whence, in imitation of the sound, has arisen the name of Wou-wou, which appears to be common to two or three species; Fred. Cuvier has applied it to the Agile Gibbon, but Camper had previously appropriated it to the Silvery Gibbon, said by Dr. S. Müller to be called Oa-oa by the natives of Java, a word differing little in the sound from wou-wou, or woo-woo. None of the Gibbons attain to the stature of the orang, about three feet being the height of the largest species standing erect, an attitude which they are capable of assuming on the ground or any level

surface; they thus waddle along at a quick pace, maintaining their equilibrium either by touching the ground occasionally with their hands or by raising the arms, so as to counterpoise the tendency of the body to fall forward. In this mode of progression, the whole sole of the hind hands, or feet, is placed at once on the ground and raised at once, as we see in the duck or goose, without any elasticity of action or strain upon the instep. Far different from this awkward imitation of the gait of man is their progress among the trees. Here, their feet, excepting while they rest upon their perch, are rarely called into play, unless indeed for the purpose of holding fruit or other objects as they traverse the forests; their arms being their almost exclusive organs of locomotion. Suspended by their hands from a branch, they launch themselves, by an energetic and instantaneous muscular movement, to another, and seizing it with one hand, swing themselves to the next with arrow-like velocity, grasping it with the opposite hand, and so on alternately. The distances thus cleared, the rapidity of the actions, and the scarcely momentary hold successively taken of branch after branch, give to their progress the appearance of aerial flight,—of the progress of a bird, rather than of wingless mammalia. In the midst of this flight, when at the utmost velocity, and when the impetus is at its maximum, they can stop instantaneously, and by a sudden action sweep under the branch, raise themselves upon it, and grasping it with their hind hands, assume their ordinary crouching attitude of repose, the transition from extreme rapidity of motion to quiescence being as surprising as the distance of their sweeping launches. Most if not all live in troops, or families, guided by a leader, and their morning cries, for it is on the dawn of the day that they chiefly utter them, may be heard resounding through the recesses of their native forests. Some species frequent the mountain districts, their range being limited by the forests of fig-trees, beyond which they do not ascend. On the appearance of man they retreat with celerity to the densely wooded valleys, and are soon lost in the obscurity of their forest home.

Their diet is altogether vegetable, soft fruits, seeds, certain grasses, tender twigs, and leaves, constituting their food.

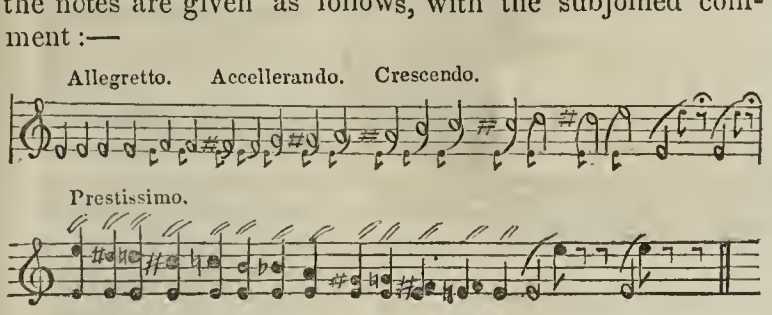
After this brief abstract of the general characteristics of the genus Hylobates, we proceed to a more explicit account of one of the most remarkable of the group, namely, the Agile Gibbon (Hylobates Agilis), the Ungka or Oengko of the Malays of Sumatra, of which a beautiful living specimen was recently exhibited in London.

The Agile Gibbon is a native of Sumatra, where it was discovered by the late Sir T. S. Raffles, whose account was published in the 13th volume of the 'Linnean Transactions' for 1822. In 1824 it was figured by Fred. Cuvier, under the name of Hylobates Lar, in his work on Mammalia, from specimens sent to Paris by Duvaucel. Duvaucel states that the animal lives in pairs, and is timid and wary; such is its activity, that it escapes from pursuit with the rapidity of a bird upon the wing, repeatedly launching itself from bough to bough at the distance of forty feet asunder, apparently without either effort or fatigue; a statement too startling not to be received with some degree of hesitation. There can be no doubt, however, that its swinging leaps are very surprising, and from what we have seen the specimen recently exhibited perform, under disadvantageous circumstances, and in a state of captivity (a state enervating the energies of all animals), we are not disposed to regard Duvaucel's assertion as utterly destitute of foundation. Less credit, we think, is to be attached to that traveller when he denies to the Agile Gibbon much intelligence; this he says of it when kept domesticated,—but we are assured by Sir T. S. Raffles that it is a belief general among the natives of the country that it will pine and die with mortification if it sees the preference given to another individual, and in confirmation of this, he adds that one in his possession sickened under such circumstances, its rival being a Siamang Gibbon, and that it did not recover until the cause of its vexation was removed to a different apartment. Assuming the correctness of this account, it speaks much in behalf both of the intelligence and docility of the Agile Gibbon, and shows it to possess feelings utterly at variance with an apathetic temperament or a deficiency of perception. However this may be, the intelligence and docility of the individual of which we are about to treat were too marked to be mistaken; and as its actions and manners were very singular, and as no living specimen had been previously seen in England, the following details are not unimportant:—

This Agile Gibbon was a female and adult, and had lived four years at Macao in captivity, previously to her transportation to this country. On entering the apartment in which she was kept (and where a large space, with a tree full of branches, was netted off for her accommodation) we were struck with the great ease and velocity of her movements, for she was then in full exercise. Using her hands in alternate succession, she launched herself from bough to bough, with admirable grace and address, and whether the one aimed at was higher or lower than that left, it was attained with the same facility, the animal exhibiting an air of nonchalance, as if the feat were of the most trifling nature. Distances of twelve and eighteen feet were thus cleared, the Gibbon keeping up the succession of launches without intermission, and that for a great length of time. Her flight might indeed be termed aerial, for she seemed but to touch the branches with her hands in her progress, the impetus being acquired during that momentary hold; and it could not be doubted that, if the animal had been in the enjoyment of liberty in her own native forest, distances far exceeding eighteen feet would have formed no interruption to her progress. It was curious to witness how abruptly she could stop in her most rapid flight, when the momentum was raised to the highest, and it might naturally have been supposed that a gradual cessation would be required. Suddenly as thought, however, she arrested her progress; the branch aimed at being seized by one hand, a rapid and energetic movement raised the body up, the branch was then grasped with the hind hands, and there she sat, quietly gazing at the astonished spectators of her extraordinary gymnastics. With the same abruptness did she throw herself into action. Her knowledge of distance, and her calculation of the degree of muscular effort necessary to clear spaces differing in degree, were very surprising, and it may admit of a question how far experience combined with instinct in rendering her so perfect in her arboreal exercises. It was easy to see that when a bough at the distance of eighteen feet had to be attained, the momentary effort was more energetic than when a branch only six or eight feet distant was aimed at, and the muscular exertion in every instance must be proportionate; yet she never overcalculated her launch, nor missed her aim either by undercalculating the space to be cleared or by not summoning sufficient energy. Great quickness of eye was indeed possessed, and she was often tried with apples and other fruits to which she was partial, and which were thrown at her, or so as to pass near her, with as much rapidity as a skilful arm could propel them; she would catch them without an effort, and with the utmost composure, nor when false throws were made, when her keeper pretended to throw, and after several feints really threw the fruit, was she discomposed, nor did she fail to catch them. But a still more extraordinary instance of her quickness of sight, precision, and activity was displayed on the occasion of a bird being let loose in her presence. The circumstance is thus narrated in the 'Natural History of Quadrupeds,' by Mr. Martin:—"A live bird was set at liberty in her apartment, she marked its flight, made a long swing to a distant

branch, caught the bird with one hand in her passage, and attained the branch with her other hand, her aim, both at the bird and the branch, being as successful as if one object only had gained her attention. It may be added, that she instantly bit off the head of the bird, picked its feathers, and then threw them down, without attempting to eat it."

While exerting her feats of agility, the Gibbon ever and anon uttered her loud call-notes, consisting of the syllables oo-ah, oo-ah, in a graduated succession of half-tones, ascending in the scale till an exact octave was attained, when a rapid series of descending notes, producing a shake, during the execution of which the lips vibrated, and the whole frame quivered, concluded the strain. The quality of these notes was not unmusical, but their loudness was deafening as heard in the apartment, and when uttered by these animals in their native forests must resound far through their stilly depths. It is principally in the morning that the Gibbon exerts the whooping cry, which is doubtless its call to its mate or companions, and it was at that time that we heard it. It should be observed that at first the syllables were slowly and distinctly repeated, and on the same note, E. As the tones rose in the chromatic scale, the time quickened, till, gaining the octave, the descent by half-tones was inexpressibly rapid; this ended, two barks followed, each composed of the high and low E, sounded nearly together. At the conclusion the animal was always violently agitated, as if wrought up to a high pitch of excitement, and shook with all her strength the branch to which she was clinging, or the netting, the cords of which she grasped with her hands. In the work already quoted, the notes are given as follows, with the subjoined comment:—

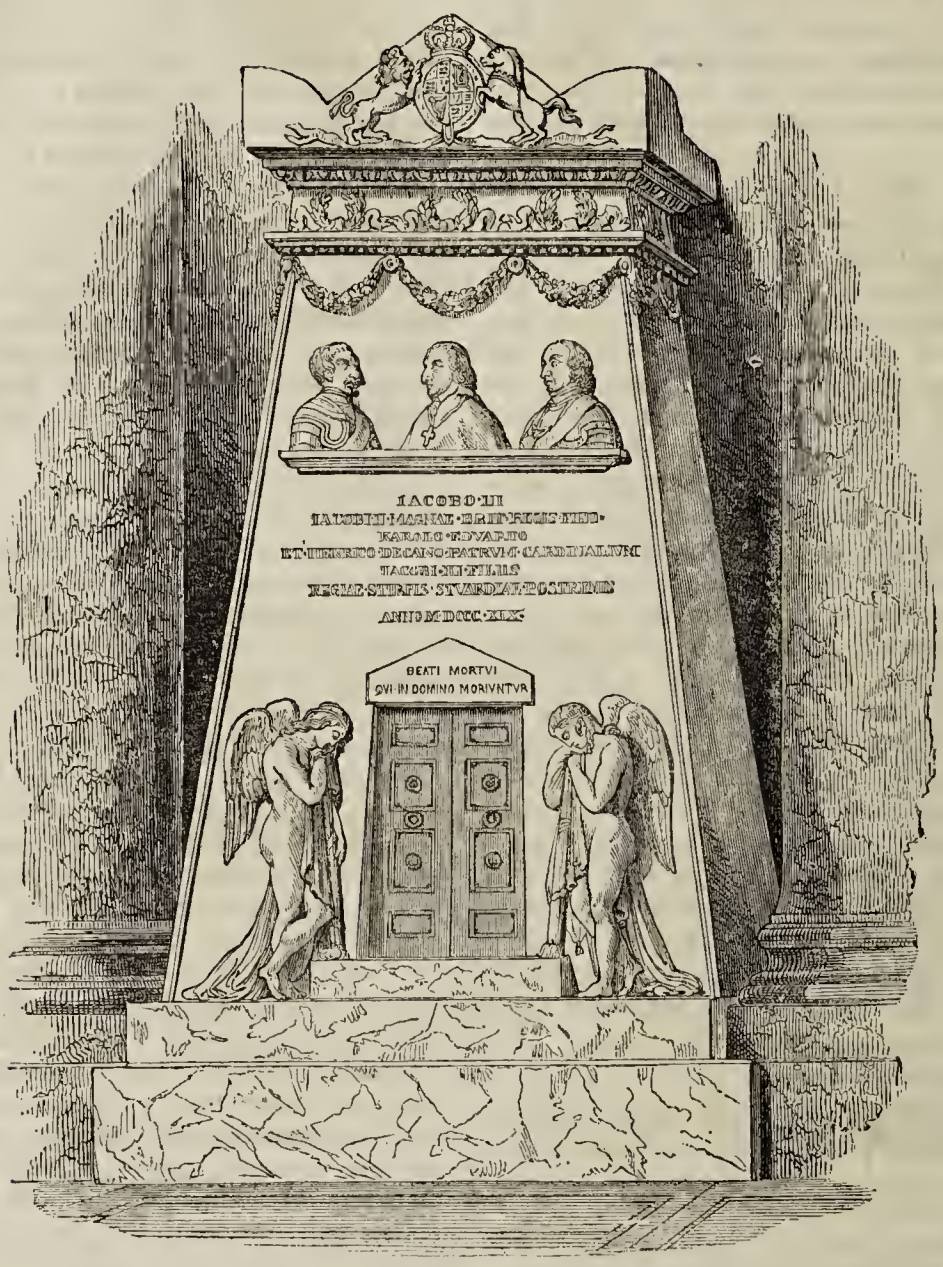


"I should endeavour to give an idea of the whooping of the Gibbon (as far as the music is concerned, but not as regards the quality of sound) by comparing it to the tuning of a harp; first beginning with an E string, and repeating it at short intervals; then being altogether silent for a little time, and then beginning again; next two strings, as it were, are struck, E and E sharp (or F natural); the second string is then screwed up by half-notes, until it reaches the octave; the E and F natural, E and F sharp, E and G natural, &c., being struck nearly together. It must be observed that before the upper note arrives at the octave, the animal amuses herself by descending a few semitones, then ascending again, and so on, but when the octave is once gained, we may imagine the upper string to be very rapidly let down by semitones, the lower note remaining the same as at first, and the two strings being always struck together. It appears all through this rapid chromatic passage as if the animal emitted the two notes at a time, as in the music, but this is the effect of the rapid transition from the lower note to the upper, and the passage is equal to that of an extremely brilliant shake." The animal then remains quiet for a time, after which the bark before noticed, consisting of the low and high E, is sounded.

With regard to the disposition and intelligence of this animal, we formed, contrary to the statement of M. Duvaucel, a very favourable opinion: she was timid, it is true, and greatly preferred the presence of females to that of men; but this evidently arose from ill treatment at some time or other, which made her suspicious of the sex from which she had experienced injury: we were told indeed that she had bitten men at different times very severely, so that it was found necessary to file off the points of her canine teeth, which were long and sharp; and we can easily conceive that, irritated by rough usage, she would retaliate as far as possible; but, as we proved, when conciliated and assured by a gentle manner towards her, she became familiar, allowed her hands or feet to be held and patted, and her soft fur to be stroked, and seemed pleased with the notice taken of her; and when a person had once gained her confidence, she would descend the netting and come to him as often as invited. But nothing of this kind was needed when females solicited her notice; she evidently knew that from them no harm was to be experienced, and she was ever ready to approach them. Her eyes were quick, and she seemed incessantly on the watch, observing all that passed about her, and scrutinising every person: crouched on one of the branches, from which another diverged so as almost to conceal her, she would peep from her hiding-place with a cautious and inquiring glance, and look earnestly at every person who entered the room or who made any movement; and there, after the exercise of the morning, which lasted about three or four hours, she would rest undisturbed during a great portion of the day: this, however, was seldom permitted, visitors wishing to see her in action; but the plan was unwise, both as it interfered with the natural habits of the animal, and as it rendered her distrustful towards her keeper. While in the Bristol Zoological Gardens, previously to her exhibition in London, she displayed great ingenuity in disentangling the loops of a cord by which she was often attached to a pole: instead of vainly endeavouring to effect her purpose by force, or by straining at the coil, she would examine the direction of the interlacement, and untwist it in a most skilful manner, and with perfect success, a task bespeaking no ordinary share of intelligence. We saw her on one occasion with a light chain suspended from a leathern collar round her neck, and this chain evidently annoyed her: had she left it dangling, it would have interfered with her movements; and therefore, while leaping from branch to branch, she held its extremity with her foot, thus preventing it from swinging about: when resting, she threw it over one of the branches, that it might not incommode her.

The beautiful adaptation of this animal not only for an arboreal existence, but for that kind of arboreal progression which has been described, could not fail to strike the most casual observer. The muscular power was concentrated in the arms and shoulders; the chest was broad, the shoulders high, and the muscles were greatly developed; the neck was short, and rendered more so in appearance by the full beard which surrounded the face; the loins were thin, and the lower limbs short; the weight therefore depending from the arms during the animal's progressive movements, as she hung from the branches, was in proportion very far less than the arms of the most slightly built man would have to sustain were he to suspend himself in the same manner; while, per contra, the muscles of the Gibbon's arms, shoulders, and chest were proportionately far more vigorous. The strongest athlete, suspending himself by one arm, cannot raise up the body; but the Gibbon, hanging by one arm, can do this with the utmost ease and rapidity of action; and, more than this, by a single muscular effort, it can launch itself to the distance of twenty, or, if Duvaucel be correct, even forty feet. The animal in question stood about three feet in height; the fur was soft, close, deep, and woolly; the face was black; the arms, the legs, the space between the shoulders, and the lower part of the back were grey; the chest, abdomen, and inside of the limbs, of a brownish-black; an obscure white bar crossed the forehead over the eyes; the beard round the face, which concealed the ears, was of a brownish-black: the reach of the extended arm was about six feet. It is not known from what country this individual was originally brought; but, as already stated, the species is indigenous in Sumatra.

CANOVA.



[Canova's Monument to the Stuarts, St. Peter's, Rome.]

ANTONIO Canova was born at Possagno, a small town in the province of Treviso, in Italy, in the year 1757. His father, Pietro Canova, was a stonemason and builder; and in assisting him in his business, young Canova obtained that mechanical dexterity in the use of the chisel which enabled him in after-times to give effect to the promptings of his imagination. At a very early age he gave strong indications of his talent for sculpture; and when he had attained his fourteenth year, he was introduced to the notice of Giovanni Faliero, a Venetian senator, who used annually to pass the autumn near Possagno. By the kind assistance of this nobleman, the young Canova was placed with one Torretti, a sculptor then residing in a neighbouring town, who had studied at Venice, whither he again repaired in a short time, taking his pupil with him. A year afterwards, however, Torretti died; and the young sculptor, unwilling to continue with Ferrari, his master's nephew and heir, established himself in a studio of his own. While with Torretti he produced his first work, a pair of baskets of fruit and flowers, done for the noble Faliero, which are still to be seen in the staircase of the Farsetti Palace in Venice. The same patron afterwards employed him on two statues of Orpheus and Eurydice, preserved in the villa of Pradazzi near Possagno. He now applied himself with greater energy than ever to the study to which he had devoted himself; and after one or two other less important performances, executed his Dædalus and Icarus for the procurator Pisani. In all these works he had aimed at a close imitation of individual nature; and this was carried so far in the Dædalus, that when it was afterwards shown at Rome the sculptor was hardly believed when he asserted that it was not moulded from a living model.

Hitherto nature had been almost his only guide; and although he had access to the Farsetti Gallery and other collections of ancient art, he does not appear to have been so impressed with the beauties of the antique as to set them up as models for himself. He may, however, have chosen to confine himself to the study of nature alone, for a certain period, more from choice and a conviction of its utility in the first stages of his artistical education, than from any contempt for ancient art or inability to appreciate its excellence; for it is certain that a close observation of nature is an excellent preparative to the study of art, and enables the student readily to comprehend the principles on which his predecessors worked, and to render their labours available to himself. It was not until his twenty-second year that Canova gave much time to the study of the works of ancient sculptors. It was about this period of his life, or in the year 1779, that Canova visited Rome, where he was patronised by Girolamo Zulian, the Venetian ambassador at Rome, by Gavin Hamilton, and other influential men. Zulian furnished him with a studio and materials, and Canova set about to improve his style by uniting the purer and broader manner of Grecian art, approaching so much to the ideal, to the knowledge he had already acquired from his close study of nature. His first work at Rome was an Apollo crowning himself, with which, however, he professed himself dissatisfied, owing to his inability to harmonise the ideal excellence he aimed at with the minute details of nature which, from his early study, had become

a characteristic of his style. This attempt was followed by a more successful one, his celebrated group of Theseus sitting on the slain Minotaur. Into this composition Canova endeavoured to infuse still more of the style of the antique; and he succeeded so well that the exhibition of it may be considered an epoch in the art. The fame which this work gained for the author established his reputation, and procured for him constant employment. His next work was the monument of Ganganelli (Clement XIV.), designed with great originality and simplicity, and placed in the church De Santi Apostoli at Rome.

On the completion of this, he undertook the monument of Rezzonico (Clement XIII.), placed in St. Peter's.

While engaged on these great works, he found time to finish smaller compositions, among which were two groups of Cupid and Psyche, a group of Venus and Adonis, &c. The beauty, softness, and inimitable grace of these figures occasioned the most enthusiastic encomiums to be bestowed on them, and procured for their author, from his Italian admirers, the reputation and title of the Sculptor of the Graces.

On revisiting Venice, after an illness brought on by severe application, the Venetian government commissioned him to execute a monument for the procurator Angelo Emo, which was afterwards placed in the Arsenal. He returned to Rome to execute the work, but first revisited his native village, where he was surprised, and somewhat disconcerted, at finding a fête prepared for his welcome. A deputation of the inhabitants lined the roads to receive him; the streets were strewed with laurel; the bells of the campanile and the *mortaletti* (usually fired on festivals) saluted him as he entered; and a band of music accompanied him to his mother's house. The enthusiasm of his countrymen went so far, that a statue was erected to him in early life, and placed in the Prato della Valle at Padua.

Among the works he gave to the world about this time were groups of Venus and Adonis, sent to Naples; Cupid and Psyche, done for Murat, and exhibited at Paris; the Kneeling Magdalen, and the Hebe, all stamped with universal admiration; indeed his extraordinary powers of execution were everywhere allowed to be so exquisite, especially in individual parts of his statues, that artists who were his professed rivals often bought casts of the joints and extremities of his fingers as perfect models for imitation.

The unsettled state of Italy consequent upon the French Revolution, and the troubles in Rome, induced Canova, about the close of the century, to retire for a time to his native province. From thence he travelled to Munich, Vienna, Dresden, and Berlin. On his return to Rome he began the model of the celebrated group of Hercules and Lichas, now in the Braccciano Palace at Rome, and commenced the beautiful monument to Maria Christina of Austria (see p. 368); after which the Perseus and the Two Pugilists engaged his attention.

He was now appointed by the pope "Inspector-General of the Fine Arts," in the exercise of which office he successfully exerted himself for the preservation of the remains of early art, and in the encouragement of contemporary artists.

After finishing a model of the colossal statue of the King of Naples, Canova received an invitation to visit the court of Bonaparte, then first consul. Thither he therefore proceeded, and received a commission to execute a colossal statue of Napoleon, to commence which, after modelling the bust of the consul, he returned to Italy. This statue, which is naked, and holds in its hand a figure of Victory, is now in the possession of the Duke of Wellington.

It would be impossible to offer anything like a catalogue of the works of this great artist; yet in this outline of his life we may mention some of his more important productions.

The Venus for the city of Florence, the statues of the Princess Borghese, and the mother of Napoleon, were the next works of Canova. The celebrated Dancing Nymphs, the monument of Alfieri, the statues of Hector and Ajax, and the much admired statue of Paris for the Empress Josephine, rapidly followed. In 1810, Canova again proceeded to the French court to receive the commands of Napoleon, and modelled the bust of Maria Louisa. On his return to Rome he finished the statues of the Empress as Concord, and of the Princess Eliza as a Muse; and next completed the group of the Graces and a statue of Peace. To these succeeded the Colossal Horse at Naples, the Recumbent Nymph, and the highly-extolled group of Theseus and the Centaur.

In 1815, when the allies occupied Paris, Canova was sent thither by Pope Pius VII. to intercede with the French government and the invading powers for the restitution of the works of art which had been torn from Rome by the treaty of Tolentino. It was only by the determined conduct of the allies that Canova was enabled to accomplish the object of his mission; and the gratitude of the pope to the British government on this occasion led to Canova's visit to London. The honours he received in England from George IV., then Prince Regent, from the nobility, and the professors of the arts, perhaps even exceeded the homage which had been paid him on the Continent.

Canova's return to Rome, in 1816, was little short of a triumph. The pope created him Marquis of Ischia, with an annual pension of three thousand crowns; but the noble-minded artist divided this sum till his death among the institutions of the arts, in premiums for the young, and in aid for the old and decayed. Long was his benevolence to rising artists the general theme of gratitude and regret; and in every case of ill-rewarded industry or fancied oppression, the exclamation was, "Ah! if Canova were alive!"

The statue of Washington, the group of Mars and Venus (for George IV.), the Sleeping Nymphs, the Recumbent Magdalen (for the Earl of Liverpool), and the monument to Pius VI., in St. Peter's, were successively produced at this highly-honoured period of his life. It is also to this epoch that we must refer the monument to the memory of the Stuarts, erected in St. Peter's, a copy of which is prefixed to this article.

The last great act of Canova's life was the foundation of a magnificent church at Possagno, the first stone of which was laid by him, July 11, 1819. Some sculptures for this church, including the beautiful group of the Pietà, or dead Christ in the lap of the Virgin, at the foot of the cross, were his last works.

In 1822 he visited Possagno, partly to see the progress of the building, and still more on account of his infirm state of health. After a short stay in the neighbourhood, his illness increased so much that he was forced to repair to Venice for medical assistance; but his recovery was hopeless, and he died October 13, 1822, in the sixty-fifth year of his age. Gratitude was among the prominent virtues of Canova, and among his legacies it is pleasing to observe that the sons of Faliero, his earliest patron, were remembered. He was buried at Possagno, but his funeral obsequies were celebrated throughout Italy, and a statue to his memory was afterwards placed in the academy of St. Luke.

Copies from the more popular works of Canova, such as the Venus, the Graces, the Dancing Nymphs, Cupid and Psyche, &c., may be found in almost every house, but casts from his more noble works are comparatively scarce, and his monuments are almost unknown, except to those whose intimacy with the fine arts has led them to seek them out. The engraving opposite is copied from the monument erected by Canova to the unfortunate Stuarts, whose unsuccessful claims to the crown of England have procured for them the title of Pretenders

James Edward, the elder Pretender, we need scarce remind our readers, was the son of James II. The lives of both him and his son Charles Edward belong to the history of our country, in whose chronicles ample details may be found. The brother of the younger Pretender, the Cardinal York, whose bust is the centre one on the monument, may, perhaps, require a short notice, as the retirement in which he lived, and his little interference with the great question for which his father and his brother hazarded their lives, have not obtained for him that place in history which his relatives occupy.

Henri Bénoit Stuart was born in the year 1725, and was known in his early years as the Duke of York. At the age of twenty-two he was invested with the robes of a cardinal, by Pope Benedict XIV., and a short time afterwards his scanty finances, which the misfortunes of his family had greatly impaired, were increased by the revenues of the rich abbey of Anchin, bestowed on him by the king of France.

Although he did not take an active part in the projects formed by his brother to obtain the crown of England, he was no less devoted to the cause; and on the death of Prince Charles Edward regarded himself as the legitimate sovereign of Great Britain. His will, which he made at that period, directs that the title of Henry IX. should be inscribed on his tomb.

He always required to be addressed by the title of "Majesty," and it is recorded that when one of the sons of George III., on his travels in Italy, wished to be presented to the cardinal, then advanced in years, he could only obtain permission on promising to address him with the etiquette due to a monarch, with which the young prince good-naturedly complied.

The Cardinal of York died in 1807, in the eighty-second year of his age. With him the illustrious but unfortunate house of Stuart became extinct. Endowed with qualities which secured to them the affections and unbounded attachment of most persons with whom they became associated, none of the members of this family seem to have been capable of commanding the allegiance of a people or of governing their affairs with a prudence which might have obtained for them as much happiness as they suffered misfortune.

To the day of his death the Cardinal of York was in communication with several persons of rank and wealth who still entertained a hope of seeing him on the British throne, and numerous important papers discovered after his death, and now preserved in the archives of this country, prove that many adherents within the three kingdoms yet remained to him and to his cause.

THE COUNTRIES OF WALLACHIA AND MOLDAVIA.—No. II.

Before we proceed to a description of these little known but interesting countries, it will be advisable to make the reader in some degree at least acquainted with their history; for by knowing the many vicissitudes they have undergone, he will the better understand their state at the present moment, and sympathise the more warmly with the struggle they are now making to emerge from the misery and degradation in which oppression has so long kept them: to that object, therefore, we devote the present paper.

The whole of that immense district which lies between the river Dniester as the one line of boundary, and the lower Danube, Hungary, and Transylvania as the other, was originally called the kingdom of Dacia, the inhabitants of which were the terrible people spoken of in the Odes of Horace. The kingdom having been conquered by Trajan, Roman colonies were founded in it, and the barbarous hordes in some measure civilised. It may be observed in passing, that to this day the Wallachians call themselves Romans, mount the eagle on their arms, and exhibit in their language, games, customs, &c. undoubted traces of the origin they claim. On the decline of the Roman empire, Dacia was successively overrun by the Goths, Huns, Tartars, and other barbarous tribes; from the seventh to the ninth century its possessors were the Sclavonians and Bulgarians. By the thirteenth century the successive invasions of the Scythians, and of the Tartars under Ginghis Khan, had driven away most of the ancient population of Dacia, when the kingdom itself became divided; and the two portions, afterwards respectively known by the names of Wallachia and Moldavia, were erected each into a principality. Although separated, the two countries preserved, with little variation, the same form of government, the same religion and language, nor from that time to the present do we find that they have ever been in active hostility to each other, but, on the contrary, have generally participated in the same course and shared in the same fate at the most momentous periods of their history. Formidable from union of interests, their alliance was courted by the kings of Hungary and Poland, and with the assistance they thus obtained, they continued more or less to preserve their character as independent states until near the close of the fourteenth century, when Bajazet compelled Wallachia to pay him tribute. For nearly a century Wallachia, sometimes alone, sometimes assisted by the Hungarians, essayed, but in vain, to shake off the Turkish yoke.

About 1520, Mohammed II., having driven away the Voyvode, or ruler of Wallachia, imposed a new governor on its inhabitants, with the title of pasha, and concluded with him a treaty, of which the principal features still remain inherent in the national constitution. The Wallachians were to enjoy the undisturbed exercise of their religion (the Greek), and their own form of government and institutions; they were free to make peace or war with any power not in actual hostilities with the Porte; no mosques were to be erected in the country, and any native who should abjure the Christian religion for the Mohammedan was to forfeit his birthright and paternal inheritance. On the other hand the Wallachians were to pay an annual tribute to the Porte, and to sell to that power, when required, the surplus produce of the soil. This last clause appears to have been made the chief instrument of the gross and ruinous oppression which so long afterwards desolated the principalities. In 1536, Moldavia, to avoid the greater evil of being compelled to submit through the conquest of the country, placed itself in the same position as Wallachia with regard to the Ottoman rule. From this period the influence of the latter extended itself so greatly, that in 1544 a portion of the territory of Wallachia was ceded to the Sultan, who then raised on the banks of the Danube the fortresses of Ibraïl, Giourjévo, and Tourno, and placed garrisons in each. Such was the state of things in 1593, when the Voyvode Michel resolved to shake off the Turkish sway. Sustained by alliances diligently sought after, he drove the Turks from the fortresses of the Danube, and held them completely in check, even up to the moment when Mohammed III., still at the head of a powerful army, was obliged, after a long war, to resign his pretensions. But the death of Michel soon restored matters to their former state: confusion and dissensions prevailed in the councils of the clergy and of the boyards, and thus the Sultan was enabled, whilst reasserting his authority, to punish the inhabitants by no longer allowing them to elect the Voyvode.

In 1710 Peter the Great of Russia made a campaign with a view of possessing himself of Moldavia, perhaps of both the principalities, but which was unsuccessful; and the monarch himself only escaped destruction by the address of his wife Catherine, who bribed the grand-vizier in order to obtain a suspension of hostilities. In the following year the sultan (Achmet), on the allegation that the reigning princes of Moldavia and Wallachia had facilitated the recent attempt of Peter, deposed them both

definitively abolished the right of electing the future rulers, and uniting both countries, sent a sovereign to govern them of his own choice, taken from among the Greek families of Constantinople, whom long habits of submission rendered fit instruments for the execution of his will. Nicolas Mavrocordato was the first Voyvode who governed the united principalities. From this period the countries were subjected to every species of extortion and degradation, owing to the Ottoman custom of farming the provinces to the highest bidder at the death of each Voyvode, or Hospodar, as the reigning prince was now frequently called. During the war between Russia and Turkey in the years 1770 to 1774, again in 1789 at the breaking out of the French revolution, and from 1806 to 1812, whilst Napoleon was in the height of his power, and Turkey seemed inclined to form an alliance with him, Russia occupied the principalities with her troops; and whatever her schemes with regard to them may have been, it would be unjust to deny the benefit she has conferred by the stipulations made in their favour in each of the treaties of peace signed by herself and Turkey prior to the evacuation of the provinces on each occasion. But the most important of these benefits is of very recent origin. When the Greek revolution broke out in 1821, the inhabitants of the principalities, worn out by the excesses of Turkish misgovernment, and emboldened both by that revolution and by the secret encouragement of Russia, attempted to recover their independence. Once more the attempt failed: both countries were occupied first by the Turkish and afterwards by the Russian troops, and reduced to a most dreadful state. Vain would be any attempt, says a recent traveller,* to paint the deplorable state of the principalities at this period; in some districts the unfortunate peasants were compelled to live upon wild herbs, the barks of trees, and similar un-nutritious substances. A supply of corn sent to them by the benevolent inhabitants of the neighbouring Austrian provinces was seized by the Russian soldiers after crossing the frontier. The entire country was reduced to ruin, and the population decreased in a short space of time to one-fourth its original amount. This deplorable state of things was put an end to by the treaty of Adrianople in 1829, by which the privilege of electing the prince was restored to each principality, and a representative government formed, consisting of a certain number of senators, in whom was vested the right of electing the prince, and of examining the acts of his government; freedom of commerce, liberty of conscience, the responsibility of ministers, were guaranteed; a quarantine and sanatory cordon established, the army organised on an European footing, civil and criminal tribunals of justice set in operation. From that treaty, therefore, put in force in 1832, dates the emancipation of Wallachia and Moldavia. A spirit of nationality and industry has since developed itself among the inhabitants; strangers have been attracted from the adjoining provinces by the great fertility of the soil and the desire to live under a government so full of promise, have become naturalised, and purchased land, which has had the effect of raising it considerably in value; merchants and manufacturers from various parts of Europe have begun the erection of the different buildings required for their commercial speculations, and altogether there seems good reason to conclude that the principalities are entering on a happier career than they have ever before enjoyed. According to the writer, however, whom we have before referred to in this paper, there is a dark cloud over the prospect—that is, the influence of Russia. As part of the treaty of Adrianople, there were two clauses, which certainly may give the Russians the power, if they have but the will, to check and perhaps destroy the growing independence of these principalities; these are, that Russia conjointly with Turkey must sanction the appointment of the prince or hospodar chosen by the respective countries, and the same with regard to the election of the inspector-general of all the quarantines. Among the other proofs of this charge is one adduced by Mr. Spencer, in a note in his book,* which we extract, and with which we conclude this historical sketch.

"M. Bezack, the Russian consul at Jassy, addressed a note to the Hospodar, announcing that the emperor had liberally granted his most gracious permission for the sons of the boyars and other distinguished individuals of the principality to be educated in the Russian universities; and when the course of instruction was completed, they would be considered eligible to every office of trust and emolument in the empire, besides being invested with all the privileges of the Russian nobility, imperial generosity only requiring in return that the Russian language should be taught in all the schools and universities throughout the principality! The Hospodar not only approved of this condescension of his imperial protector, but had the insolence to submit the note, with his own approval, to the consideration of the general assembly of the boyars, who, much to their honour, indignantly returned for answer 'that they would never consent that the Russian language should be taught their sons; neither would they permit them to be educated in any other country save their own.'"

* Spencer, 'Travels in the Western Caucasus.'

FEIGNED DISEASES.

An exemption from disease is considered by the majority of mankind as the greatest of blessings, and those persons who have the misfortune to be afflicted with any ailment usually carefully avoid inviting public attention to it. At first sight, then, the simulation, nay, the actual voluntary production of what all seem so anxious to escape or disclaim would seem most improbable; but a little knowledge of what is actually passing around us in the world will soon convince us that the feigning of disease is carried on to a great extent. The numerous treatises existing upon the subject, and the great medical knowledge and acumen which have been often employed in the detection of these cases, show at once the extent, importance, and difficulty of the subject; but it would be foreign to the objects of this publication to enter into the numerous details, and to examine the various rules which have been laid down for the guidance of the observer. We only purpose making a few general observations upon the motives inducing persons to practise these impostures, and upon the modes of detecting them. Some examples, remarkable for the ingenuity of their contrivance, or for the obstinacy with which they were persevered in, will be added.

We will follow the enumeration furnished by Drs. Forbes and Marshall of the description of persons who usually feign diseases, and of the motives actuating them:—1. Recruits, soldiers, and sailors form perhaps the largest class. Their object is, either to avoid entering the service at all, or, having done so, to obtain exemption from some peculiar duty, or to procure their discharge, with or without a pension. They are known in the army by the term malingerers, and in the navy as sculkers. 2. Slaves often thus seek to obtain a temporary cessation from their cruel labours, and the comforts a hospital affords. 3. Persons under the cognizance of the laws often feign disease in order to escape punishment. 4. Persons in civil life who have received slight injuries sometimes exaggerate their complaint in order to extort disproportionate compensation. 5. The professed mendicant often seeks, by the simulation of misery and diseases of every kind, to escape work and extort charity. 6. Some persons assume an appearance of being afflicted with disease without obvious motives; these are, however, few in number, and generally young women.

It may be thought that, however easily impostors might

* Vol. ii., p. 255.

pass off their fietitious complaints as real ones upon the publie in general, that deteetion would immediately follow their attempting to do so upon medical men. Such is not the case, and Fodéré deelares, that while the conscription was in full force in Franee, to so great a pitch was the art of simulating disease carried in that eountry, that it became nearly as diffieult to detect a pretended disease as to eure a real one. Not only is a most wonderful ingenuity frequently exereised by these persons in counterfeiting maladies, but they are often aided in their efforts by the obseurity attending many diseases; several of these being unattended by alteration in the pulse, change in appearance, or derangement of function, the chief indications of their presence are derived from the statements made by the patients themselves. Again, by the taking of eertain medieines, or the applieation of irritating substanees, existing diseases may be aggravated or others produeed. In the army, measures of great severity are sometimes resorted to in order to detect these impositions, but almost all writers agree in depreeating these as ill-judged, and in declaring that more is to be gained by finesse than by harshness. An unwearied perseverance, and seeming the dupe of the artifiees employed, have often sueeeeded. The pretender is usually prone to overact his part, and, if encouraged to speak freely upon the subjeet, will often betray himself by some inconsistent statement; "he seems too anxions to impress upon his attendant the reality and severity of his sufferings, and throws out remarks purposely to obviate objections, and to reeoncile the mind to what may seem extraordinary in the narrative."

The responsibility resting upon the medical offieer is most serious, for while on the one hand the serviees of the eountry have been seriously impaired by these deeeits, and impostors have often received emoluments and immunities due only to the deserving and distressed, so on the other hand it is too true that persons really suffering from the effeets of disease have been suspected as impostors, and that the diseipline to which they have been subjeeted has hastened their dissolution. Surely it were better that a thousand deceivers should eseape punishment than that one person should suffer throngh the uncertainty of the medical art.

A few examples will exhibit a fixedness of purpose which, had it been turned to good account, might often have produced excellent results.

Blindness, total or partial, is frequently feigned. Mahon relates a remarkable case, which occurred to himself during the bloekade of Luxembourg. A young man, having been on duty all night, next morning declared himself quite blind. The eyes seeming quite natural, his statement was discredited. He had blisters, setons, &c. applied, for whieh he seemed truly thankful, but deelared himself noway relieved. At last, as a crowning trial, he was placed at the brink of a river, and desired to walk forward; he did so, and fell in, but was speedily reeovered by some boats placed near expressly. The medieal offieers now promised him his diseharge, and he, relying upon this, at onee took a book and read aloud. Blindness was simulated to a great extent by the conscripts of the French army, who produeed several of its symptoms by the use of nightshade and henbane; two hundred thus obtained exemption. In Egypt, a disease called night-blindness often prevails, and Dr. Cheyne says this was simulated to such an extent in Sir Ralph Abercromby's expedition, that half of some of the corps were disabled. It was cured by retaining the men on duties whieh did not absolutely require eye-sight to perform them. Inflammation in the eyes has often been eaused by the introduetion of snuff, salt, tobaeco-juiee, &c., and three hundred soldiers were thus affeeted at the Chelmsford barracks in 1809; the affeetion was at once arrested by the discovery of small paekets of eorrosive sublimate. Dr. Veteh observes, the right eye is almost always the one affeeted, this being the important one to the soldier. The loss of one eye was formerly very frequent, when government gave a pension of nine-pence per day for the loss of one only, which is not now the case.

[To be continued.]

Beauty.—Beauty is as summer fruits, which are easy to corrupt and cannot last; and, for the most part, it makes a dissolute youth, and an age a little out of countenance; but yet certainly again, if it light well, it maketh virtues shine, and vices blush.—*Lord Bacon's Essays.*

[Monument to the Archduchess Maria Christina, by Canova.]

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THE FISH-PEOPLE OF ABERDEEN.

[Fish-woman of Aberdeen.—From an original sketch.]

THERE is a natural tendency in all highly artificial states, such as that of our own country for instance, to induce a general uniformity not only of manners, dress, language, &c., but even of modes of thought and principles of action; for each class being more or less dependent upon the others, a continual communication with all its consequences must be inevitable. In Great Britain this effect, like the civilization of which it is but a type, is of course more rapidly developed than in other countries, on account of the greater density of the population, and the extraordinary and daily increasing facilities that population possesses for bringing all its parts into contact with each other; and thus it is that all the more salient points of character or individuality are worn away, and that we cease to look within the boundaries of our own shores for anything strikingly distinctive. But this, though true of the great bulk of our population, is open to many curious exceptions. There still exist, even in Great Britain, whole classes of people who, for any advantage they derive from their proximity to their more enlightened countrymen, might as well be in the most distant parts of the world. We may mention the markedly dissimilar characteristics of the fishermen, agriculturists, and miners in Cornwall; the colliers of Staffordshire and the north of England, &c.;* whilst there are others again, who, although not secluded from society, exhibit a marvellous tenacity in preserving intact their own independent and original habits: of this class the people engaged in the fishing trade are probably the best representatives. In showing to what an extent differences may prevail in all the points we have before enumerated, even in a single town, we can select no instance more favourable than that of the fish-people of Aberdeen in Scotland, of whom an excellent account has been given in the 'London and Westminster Review,'† which we therefore proceed to quote. "This handsome and flourishing town consists of about sixty thousand inhabitants, who are distinguished even in Scotland for their shrewdness. At the mouth of the river Dee, and in two squares, called Fishers' Squares,

* See 'Penny Mag.,' vol. iv., p. 123; vol. v., p. 48; and vol vi., p. 302.

† December, 1838. Article, 'Songs of the Metropolis.'

separated from the rest of the town by only a few dock-yards, are a race of people who differ more in dialect, customs, superstitions, and other peculiarities, from the Aberdonians, than the latter do from any of the other inhabitants of the lowlands of Scotland. They are a completely separate community; and their dialect is so different from that of the working classes of Aberdeen, that though the two races have a sufficient number of words in common for transacting business with each other, most of the words used by the '*Foot Dee*,' or '*Fittie* folk,' among themselves, are unintelligible to the 'Aberdeen folk.' If a native of Aberdeen were to wander into the square inhabited by the 'Fittie folk,' who are almost all fishers and pilots, he would run no little risk of being pelted out again with stones and haddock-heads. The 'Fittie folk' scarcely ever intermarry with the other citizens. Their marriages are generally 'penny weddings.' They seldom send their children to school, and almost never to a promiscuous one. Their sons are almost invariably brought up to follow the occupations of their forefathers, and never learn any regular trades, except that perhaps now and then a youth, more adventurous than usual, becomes a ship-carpenter. They live together patriarchally, sometimes three or four generations in a single room. The oars are laid above them on the couples (or rafters) of their cottages; the children may be seen sleeping on nets in corners; and on the walls are creels, baskets, and other fishing-tackle. Their boats descend by primogeniture. Their women have not merely a costume different at all times from that of women in a similar rank of life in Aberdeen (distinguished by an all but exclusive preference for the colours white and blue, and consisting generally of a blue striped wrapper, blue baize petticoat, and close cap, called a *toy mutch*, with *moggins*, or stockings without feet, and they wear no shoes); but they also adopt very generally the masculine blue jackets of their husbands and brothers. The men do little more than go out with the boats. The women search for bait, assist in carrying the nets, bait the hooks, and do all drudgery, while their lords are looking on with folded arms. . . . . The women, both of Foot-Dee and those of the same race in several other villages on the east coast of Scotland, carry great loads of fish to market on market-days in creels (large wicker baskets, which are fastened to their shoulders and rest on their hips), sometimes as many as eleven miles before breakfast; and so necessary does the load become to them to enable them to walk steady, that when they are returning home, they prefer carrying stones to carrying an empty creel. They never walk but in single file, and they have a superstitious dread of being counted, a fear of which the boys of Aberdeen avail themselves to annoy them by crying as they pass—

> 'One, two, three;
> What a lot of fisher nannies I see.'

"A salutation equally dreaded by them is the cry, 'A baud's* fit in yer creel,' *i.e.* the print of a hare's foot is in your creel. This saying derived its meaning from the circumstance that a hare was seen to run through their 'fish town' on the evening preceding a day on which a great number of their people were lost at sea. To point at their boats with the fore-finger is the surest way of offending them. Among these people all the superstitions which useful knowledge is banishing from the homes of the poor still flourish. The belief in lucky days and omens of stars and clouds is to the present hour a practical faith under the low thatched roofs of those squares of white cottages among the sand-hills of the sandy beach at the mouth of the Dee, occupied by this curious race, who still tremble with the fear that a neglect of these things would bring great evils down upon their heads. They observe Old Christmas, and all their transactions and calculations are made by Old Style, to which they tenaciously hold, saying, 'New Style is man's makin', but Auld Style is Guid's.' Now all these things are nearly as strange to the citizens of Aberdeen as to the natives of any part of the empire."* Having mentioned the word haddock, it would be unpardonable to omit all notice of the delicacy so famous in London, the 'Finnan Haddocks,' which form one of the chief articles of the trade of the people herein described. Finnan (Findhorn) is a small village famous only for its fishery, situated about six miles to the south of Aberdeen. Of the excellence of this fish perhaps the most decisive proof that can be given is that the burghs on the Frith of Forth and other places have regular manufactories of a spurious article, which they vend under its name, and doubtless to the detriment of its reputation among the deceived but unsuspicious purchasers.

* 'This word baud,' the Scottish "provincial name for a hare, illustrates a passage in Shakspere's 'Romeo and Juliet,' Act 2, Scene 4, the point of which has escaped our commentators." ('The Book of Bon-Accord, or Guide to the City of Aberdeen,' 1839, p. 269.)

* Aberdeen is full of stories of them. "A Fittie fisher" once came to London; and on seeing St. Paul's, exclaimed, "This ding's the kirk o' Fittie." A woman of this class went to the post-office and asked for a letter "from our Jack." She was asked what was her name or her husband's; but she exclaimed, "I'se behaud you," i.e. I'll beware of you; and not tell.

FEIGNED DISEASES.

[Concluded from No. 543.]

Pretended deafness is by no means unfrequent. Mr. Dunlop and Baron Percy relate cases where this has been so well feigned, that musketry suddenly discharged near the ear has produced no effect. In one instance, the patient, being put to sleep by opium, started out of bed on the firing of a pistol, and thus betrayed himself. To imitate the manners and expression of countenance, however, of the deaf successfully, requires much address, and how much more so when dumbness is pretended to be present at the same time. Fodéré says that the most expert imitators of dumbness are women. An accomplished impostor was detected by the Abbé Sicard. This man, Victor Foy, resisted for four years the most varied investigations and the most strict surveillance; even during his dreams, or when awoke from his sleep suddenly, he only uttered a low plaintive moan. He was liberated from the prison in which he was confined, but he now over-reached himself, for he wrote some lines, declaring himself the pupil of Sicard. The abbé, on seeing his writing, at once declared him an impostor in pretending to have been born deaf and dumb, for he wrote from sound, while the deaf and dumb write only as they see. He confessed eventually.

Madness has been often affected, and owing to the ignorance which so generally prevails as to the true signs of its existence, often with success; poetry and history record examples in abundance of its having been pretended, of which we will only instance Ulysses, David, Hamlet, Solon, and Junius Brutus. The pretender is usually found over-acting his part, and wanting in frequent characteristics of insanity, such as sleeplessness, abstinence, &c. It is too true, however, that persons really insane have been treated as impostors.

Long-continued somnolency has sometimes been pretended with wonderful perseverance, of which the case of Phineas Adams, related in the fourth volume of the 'Edinburgh Annual Register,' is a remarkable example. This man was confined in gaol for desertion from the militia, and from the 5th of April to the 8th of July, 1811, he lay in a state of perfect insensibility, resisting every excitement, such as snuff, electricity, &c. He sucked fluid nourishment through his teeth, as his jaw could not be opened. The surgeon, believing an injury to the head to exist, detached the scalp for the purpose of examining it: a slight groan was all the sign of feeling he gave.

He was discharged and sent home to his father. A day or two after he was seen thatching a hay-rick.

Various kinds of fits and convulsions are frequently imitated by mendicants to extort alms. These affections are especially suited to these tricksters, as they do not require the untiring attention and unremitting watchfulness which other simulations do, while they can be assumed at times most convenient to the pretender. Mr. Hunter detected a case of catalepsy in an ingenious manner. In this kind of convulsion, the limbs, &c. remain in the same position in which they are when insensibility seizes the patient. In the present instance the man's arm was outstretched. "Let us see," said Mr. Hunter aloud, "what additional weight this poor man's arm can bear." He slipped a noose over the hand, to which a small weight was attached; the arm continued immoveable. Mr. Hunter silently cut the cord, and the man's arm was suddenly raised, owing to the degree of voluntary power he was at that moment exerting to sustain the weight.

Severe pain is often feigned with great success, because many neuralgic affections are indicated by no kind of change of appearance whatever. A young recruit who had been decoyed into the service, soon after pretended a deep-seated pain in the knee, for the removal of which he consented to and even implored the trial of all sorts of remedies, many of them of the most severe character. After being thus four years under care, he obtained his discharge. He shortly after cast away the wooden leg he had worn for three years, and acknowledged his deceit, which he defended upon the principle of retaliation. Dr. Thomson relates a case of obstinate tic-douloureux occurring in a young lady, who by reason of it obtained her removal from the school she disliked. In one of the attacks, Dr. T., wishing to try the effect of a strong nervous impression, and having heard of her antipathy to dogs, declared that her cure could only be effected by rubbing her face upon the back of one of these animals. The complaint vanished and did not return for eighteen months, and the case was published as an example of the effect of mental impressions upon nervous affections. Several years after, this young person confessed to having feigned the disease.

Wounds, ulcers, and mutilations are all frequently both feigned and produced in the army and navy. Trifling ulcers on the legs are often rendered serious by irritating them with caustic, lime, &c. An old woman at Dublin acquired a great reputation among the recruits for producing these ulcers by means of a mixture of soft-soap and quicklime. Many recruits produce them by making an incision into the leg and binding into it a copper coin. To prevent patients tampering with their sore legs, military surgeons have often been obliged to seal the bandages enveloping them; but this has not always sufficed, as the men often thrust pins and needles through the bandages, so that recourse has at last been had to locking the leg up in a box after it has been dressed. Wounds or injuries are often pretended by the cowardly at the time of action, to get excused from participating in its dangers, and sometimes the men actually put themselves in the way of receiving slight hurts in order to avoid having to risk the chance of greater. This deceit is not confined to the privates, for officers have been detected feigning having been wounded, in order to procure either exemption from service or their names to be gazetted. But by those determined to quit the military or naval service, wounds of a serious character, or even mutilations of portions of the body, have been produced. It was a frequent practice of the conscripts of ancient Rome to cut off the thumb. Mutilation was also very frequent among the French conscripts, and was only averted by resolving to retain the men in the army, although thus disfigured. It was very common for these men to extract or break their front teeth, so as to disenable themselves to bite the cartridges In the services of our own country acts of mutilation have been very frequent, and often perpetrated with a desperate boldness even in the presence of officers or companions. In this way, one or more fingers, or a portion of the hand, were often cut off. Others again pretended the injury resulted from accident; and between 1824 and 1828 there were made in Ireland twenty-one pensioners for injuries of the hands received during the explosion of their muskets. Such cases often occurred during a furlough. The recent regulations, which retain the person in the army, unless he have received his mutilations during an action, have materially diminished the number. Persons have inflicted wounds upon themselves, pretending to have received them while defending others. Dupuytren relates an instance of a young man, who, while Bonaparte was walking in the park of St. Cloud, precipitated himself into the middle of the crowd which surrounded him, exhibiting two wounds, and crying, "Assassins! Save the First Consul!" He pretended to have overheard a plot for the assassination of Napoleon, and for that reason some of the conspirators had endeavoured to kill him. Every inquiry was made in vain, and the wounds were eventually discovered to have been self-inflicted. Somewhat connected with this subject is the curious fact of persons having been known to run needles purposely into their body. Cases have been often recorded in which needles swallowed accidentally have appeared long after in various parts of the body; but it is not to these that we now allude. A young woman, a patient of Richmond Hospital, Dublin, in 1818, had her arm amputated for a diseased state of it, produced by the presence of needles, which she afterwards confessed she had been in the habit of forcing into her hand and arm. Rachel Herz excited much attention at Copenhagen in 1807. Abscesses formed in various parts of her body, out of all of which were extracted needles. She thus became a dreadful mass of disease, and it was only learned by accident that she had been in the habit of introducing these needles purposely. Four hundred were removed in three years.

In concluding this extraordinary and melancholy list of simulated diseases, we may be permitted one remark. It is this: that, although our censure would be justly bestowed upon persons capable of such actions, yet, if we stopped here, we should take but a very narrow view of the subject. When we find so large a proportion of these dissemblers to consist of soldiers and sailors, we may be sure that some grave error pervades their respective services, which it should be the object of society to amend. The sailor, dragged on board a man-of-war by impressment, or the peasant or artisan, decoyed in a moment of despair or intemperance by the persuasions of the recruiting serjeant, finds himself sentenced to unlimited servitude, with no hope of liberation and but little of promotion. So too, the conscript, brought up as he has often been in a comparatively respectable sphere of life, and perhaps assiduous in the cultivation of the arts of peace, finds himself torn away from all he loves, certainly for a long period, and perhaps for ever, and devoted to a service for which he may feel a positive dislike. Mendicancy, also, has furnished, and will, while it exists, furnish, an ample stock of pretenders. In suppressing it by relieving the really poor, and distinguishing them from the idle and vicious (which we may hope to see accomplished by the endeavours now making to elevate the character while relieving misery), we should soon find this class of impostors cease to exist. In one word, the true means of preventing the production of similar impostures consists in elevating the position which these classes hold in social life, and, above all, educating them so as to enable them to appreciate and act up to such improved condition.

THE COUNTRIES OF WALLACHIA AND MOLDAVIA.—No. III

[Bullock Caravan in Moldavia.]

WALLACHIA is situated in the north-eastern part of Turkey in Europe, and is bounded on the west, the south, and the east by the river Danube, whilst on the north it is bordered partly by Moldavia, but principally by the Carpathian Mountains, which separate it from Transylvania. Its entire length from east to west is above three hundred miles, its mean breadth about one hundred and fifty. The half of that space, extending towards the east, presents a succession of plains watered by numerous but inconsiderable streams; the other half, or northern portion, rises gradually upward towards the Carpathian hills: in this last, the great abundance of water and the rich vegetation unite to form the most agreeable part of the principality. No great navigable river runs through Wallachia. The climate is exceedingly temperate: the winter, or at least the rigorous portion of winter, lasts but about two months. The plains unfortunately are subject to terrible inundations, particularly during the spring; and if the winds of the south-east, which bring the vapours of the Black Sea, continue so late as June, the storms, often periodical, so completely deluge the plains as to make them perfectly impassable. In the open part of the country endemic fevers are frequent, but rarely fatal; and in some of the mountainous districts we find the inhabitants disfigured by the hideous goître. In the general aspect of the country we perceive but too distinctly the unhappy nature of its history, for whilst there are few parts of the globe that have been more richly endowed by nature, there are still fewer (among those with any pretension to civilization at least) in which natural wealth has been made so little use of: bad government, and the frequent military occupation of the principality, have reduced it to a state but little better than a desert. In connection with the appearance of the country, Spencer mentions that the thistle, on the banks of the Danube, "proudly rears its lofty head to a height of at least seven feet. Its myriad of blossoms form a forest in bloom, and not only charm the eye by their bright colours, but fill the air with the balmy fragrance they emit."

Wallachia contains twenty-two cities or large towns, fifteen market-towns, and three thousand five hundred and sixty villages. The number of houses in 1837 was 339,322; and of the population, 1,751,182. The inhabitants are composed of three classes, the boyards or nobles, the general people of Wallachia, and the Tsiganes or gipsies; each possessing a distinct physiognomy. The boyards are the owners of the soil and the exclusive directors of public affairs; they are at the same time exempt from the charges of the state. According to M. Démidoff, this privileged class are peculiarly marked by a fatal improvidence, which they owe to their oriental habits and to the precarious state of the country. They abandon themselves to an unproductive luxury which is fast undermining their fortunes. Through all that luxury, too, one is struck with the sad and unhappy appearance presented by their idle attendants, by their numerous but ill appointed equipages, and by their vast but dilapidated hôtels. In a visit to one of them, the good manners of the master, the grace and talents of the females of his family, the facility and purity with which they speak the languages of Central Europe, the taste, tact, the frivolity even of their conversation, give the idea of a society equal to the most distinguished of Europe; but behind the door of the hall, the throng of filthy and idle valets who strew the vestibule and sleep upon the stairs, show you at once you are in Wallachia. Of the people, the robust peasants of Wallachia, it may be said that whoever goes among them becomes interested in their favour, although in their manners there remains plenty of room for improvement. They might produce much, and for a good market ("the Danube," says M. Démidoff, "waits only for the grain of the Wallachian plains to go and fill the granaries of the Black Sea"), but for their habits of idleness and intemperance, and for their love of festivals, which are mischievously numerous in the religious observances of the country. To root out these fatal habits must form the most important task of an enlightened government. The third class of the population is that of the Tsiganes or gipsies. These are numerous in Wallachia, and, in spite of the filth and brutish stupidity that but too frequently characterise them, afford by their noble and sweet countenances a strong support to the opinion

that the gipsies originally came from the beautiful climates of the East. The indolence so universal among the natives of Wallachia affords a great encouragement to the Tsiganes, who, by adopting the pursuits refused or scorned by the former, obtain to a certain extent the protection of the law. The tribe may be said to divide itself into three distinct classes. On the first devolves the business of washing the sands impregnated with gold. The second is formed partly of masons, farriers, cooks, locksmiths, &c., all those employments being disdained by the Wallachian population; but the greater majority of this class are devoted to slavery, and fill the houses of the boyards with a crowd of attendants, useless, and dangerous to come in contact with. The third class are, in few words, mendicants and vagabonds. Hardly clothed, and subject to the inclemency of the seasons, the men and women of this class encamp in the open air, with a troop of hideous infants, whilst, strange to say, their young people of both sexes are remarkably fine, slender in person, and possessing a noble gait and appearance. With the object of extinguishing this state of vagabondage in the principality, houses are being built for the Tsiganes, where they must remain and apply themselves to the more creditable employments of agriculture. The Wallachians raise to guard their flocks a species of magnificent looking and intelligent dogs. Owing, however, to their unlimited propagation, they have become quite a nuisance in many parts. Not to speak of the annoyance caused by their lugubrious howlings at the approach of night, there is considerable danger in meeting in the streets of a city with a pack of these animals unless one is armed with a stick. Wallachia is subject to a very severe plague, namely, clouds of locusts, which lay the richest plains waste in a few hours, and cause a terrible amount of loss and privation. A premium is established for the destruction of these mischievous insects; in consequence of which, in a single district of Wallachia, no less than two thousand eight hundred and thirty-one bushels were collected in 1837.

The principality is divided into seventeen districts, each of which is governed by two officers chosen from the boyards, and known by the name of Ispravniks: a judge, and a Samessi, or overseer of the revenues, charged to control the administration of the Ispravniks, have recently been added. This last-named functionary is appointed for life, whilst the others are liable to be removed every year: an arrangement that is not considered very conducive to the public good. The districts are subdivided into 'arrondissements,' which are called plaça, each plaça being the seat of a collector of the imposts. The chief towns in each district are governed by a municipal council, under the direction of a president or mayor, aided by three assistants. Justice throughout Wallachia is rendered in the name of the prince, and by the regulations of the Wallachian code promulgated in 1818. That code, based upon the Roman law and upon the common law of the country, has preserved much of a despotic character, but has received recently some important ameliorations. A code of commerce, and a criminal code, imitated from the French with such modifications as the political and geographical situation of the country required, were submitted to the General Assembly in 1837, when the former was partially adopted, and the remainder, with the criminal code, put off till the next session.

Except under certain circumstances the young people of Wallachia do not attain their majority till the age of twenty-five. Divorce is permitted in certain cases anticipated by the law, and the parties may marry again immediately. Divorces may also be obtained on the allegation of incompatibility of temper, but in that case seven years must elapse, when no further opposition is made. The minister of public worship includes in his department not only ecclesiastical affairs, but also those connected with public instruction. Religion, which here takes the Greek schismatic form, does not appear to have any great influence over the minds of the people, but exterior customs are observed with the most scrupulous exactness. The principality reckons no less than three thousand seven hundred and fifty-three churches, of which one thousand three hundred and sixty-four are built of stone. There are also two hundred and two monasteries. The Wallachians are naturally very superstitious, they believe very willingly in sorceries and witchcraft, without however allowing their belief, which is rather a traditional poetry than anything worse, to seriously trouble their repose. There are two public colleges, St. Sava in Bukharest, and at Craïova, including together, in 1837, 1183 scholars; the other public schools of the principality contained 2599 scholars: making in all 3782 individuals educated chiefly at the expense of the state. Independent of the instruction thus provided, reading and writing are taught to the children of the peasants in every village.

The revenues of the state in 1837 amounted to 14,824,195 piastres, which was paid by 296,286 families. The chief sources of revenue are the capitation tax levied upon the labourers, the Masiles (an inferior order of nobles), and the Tsiganes, which amounted to 8,480,175 piastres; the customs and duties, &c. amounting to 3,834,020 piastres, and the farm of the salt-mines to 2,500,000 piastres. The amount levied upon the peasants is thirty piastres per head for the general government, and three for the common fund established in each village. The expenses of the state in the same year were as follows: tribute paid to the Porte, 1,400,000 piastres; the general costs of the government, 13,233,118 piastres: making in all 14,633,118 piastres. The piastre is received by the government at the rate of ten and a half piastres for one silver rouble (the Russian), which in English money is worth about 3*s*. 1*d*. The other coins in use are the golden ducat of Austria, worth about 9*s*. 5*d*., the zwanziger of Austria, worth about 8*d*., and the Turkish para and asper, of which forty of the former and one hundred and twenty of the latter are equivalent to one piastre. The importations into Wallachia consist principally of foreign manufactures, and in particular of oil, soap, and coffee from Turkey. The articles of export comprehend of course the chief productions of the country, grain, hemp, hides, cattle, wood, honey, wax, some little wine, salt, wool, and a small quantity of silk, the manufacture of which has recently made some progress. The amount of the imports on an average of the years 1831 to 1835, was 31,848,070 piastres; of the exports, 49,159,585. Besides the silk manufacture, some fabrics of hats and of printed handkerchiefs have been established. It is not to be wondered at that trade, manufactures, and commerce should have languished in Wallachia, when we consider not only the ruinous wars and military occupations it has undergone, but also that the people were for a great length of time debarred from selling anything except to the Turks, *who paid their own price*. All that, however, is now changed; and within the four years ending in 1837, no less than six hundred and thirty-one manufactories had been established, comprising one hundred and eighty-four tanneries, twenty-eight soap-manufactories, sixty-nine potteries, ninety-one common cloth manufactories, &c. There were in 1837 two thousand nine hundred and ninety-nine water-mills, six windmills, and nine moved by horses. Salt is still the only mineral product obtained with advantage in Wallachia, although the country is so rich in treasure of this kind, including gold, copper, native mercury, &c.

The systems of government in both these principalities being founded on the great treaty of Adrianople, which we have before so frequently referred to, and their political and social history having been so closely mingled, it naturally results that they present a striking similarity in their chief features, and that the description of one comprises in a great measure the description of the other.

Moldavia is bounded on the east by the Russian province of Bessarabia, which, before the peace of 1812, constituted a part of the principality, and from which it is separated by the river Pruth; on the south by the Danube and Wallachia, on the west by Transylvania, and on the north by the Buckowinc, and a part of Gallicia, or Austrian Poland. Its extreme length from north to south is about two hundred miles, its breadth about one hundred and twenty; the entire area comprises about seventeen thousand square miles. The branches of the Carpathian Mountains which separate Moldavia from Transylvania send out offsets into the interior of the country, which as they advance towards the banks of the rivers Sireth and Pruth decline in height, and there terminate in eminences covered with vineyards. This district recalls in many parts the picturesque beauties of Switzerland and the Alps. Moldavia is divided into Upper and Lower, these being again subdivided into thirteen districts: the capital is Jassy. In all, there are seven cities enjoying the advantages of municipal government, which they owe to the recent changes. The municipal councils are chosen by the principal inhabitants every year. The revenues of the municipalities are derived mainly from duties upon liquors and tobacco, and are made very instrumental in advancing the progress of the respective cities, by being expended in the better lighting and paving of the streets, the building of bridges, and other works of public utility. Moldavia is still a purely agricultural country; its prosperity therefore depends above all upon the abundance and good quality of its harvests. From 1831 to 1835 great suffering was caused by the scarcity of grain, and by the high prices demanded in the market. To remedy these evils a peculiar precaution has been adopted:—a reserve has been formed in each village, to which each villager must bring, immediately after harvest, five bushels of maize, which he is not allowed to draw out for three years. The practical value of this rule has yet to be tested, for since the period mentioned the new circumstances of the country have caused such a marked increase of its agricultural productions, that, in spite of a growing export trade, there has frequently been more than could be consumed, and in no case any deficiency. The system of taxation in Moldavia prior to the treaty of 1829 was most iniquitous, on account of the great number of exemptions it allowed. No less than 7895 families, or about 40,000 individuals out of a population considerably less than a million in number, were at one time thus exempted from the burdens of the state. The principle of exemption still exists, but it has been considerably limited in its application. The public revenues are now derived principally from an impost of thirty piastres on each labouring family, and of from sixty to two hundred and forty piastres on artisans, tradesmen, &c. A census of the number of each class of contributors is made every seven years, and on each occasion the total amount to be received for the years ensuing remains fixed on the basis of that census till the next is taken; an increase therefore in the number of families liable to contribution in any particular place lowers the rate of taxation in that place, as a decrease raises it. The charge upon each family is in proportion to the number of cattle it possesses. The contributing population of Moldavia was, in 1838, about 1,002,000; the number of the non-contributing we do not find anywhere given, but it would not probably then exceed a few thousands. The revenues amounted, in 1839, to 8,491,956 piastres. Among the disbursements we may mention the tribute paid to the Porte, which amounted to 740,000 piastres.

The rights and reciprocal duties of the proprietors and of the labourers have been fixed by a particular law, which, among other matters, acknowledges the right of the villagers to tranfer their residence from one part to another in pursuit of what they consider their interest, and also gave to each villager the use of a considerable quantity of land, arable, prairie, and pasture, and for the site of his house and kitchen-garden.

The public schools of the principality have revenues to the amount of 400,000 piastres; the total number of their scholars educated, in 1838, was eleven hundred and eighty-eight. The number of persons arrested in 1838, for criminal offences, was two hundred and thirty-two; of these eight died in prison; eighteen were condemned to the salt-mines, fifty-seven to labour at the public works, seven to transportation, six to seclusion in the monasteries, and one hundred and six acquitted: the fate of the remaining thirty is not stated. The climate is much colder in winter than might be expected in a latitude corresponding with the north of Italy: the rivers are then frozen and the ground covered with snow. Moldavia is subject to earthquakes, which are not, however, very violent: the most remarkable occurred on the night of the 3rd of February, 1821.

The improvements that have taken place in this principality within the last few years are very striking. In 1837 alone an immense quantity of additional land was brought into cultivation: Merino sheep were introduced, better methods of breeding cattle adopted, and some domestic manufactures of paper, Dutch ware, &c. made their appearance. But the amount of the exports in 1832, as compared with those in 1837, shows this matter in the strongest light; in the former year they amounted to 11,862,430 piastres, and in the latter to 17,353,611. The imports, in 1837, amounted to 10,878,021 piastres.

The people of Moldavia are robust, sober, and hard working, and bear well the variations of climate to which they are subject. In appearance they differ materially from the Wallachians; their look is less open, and their habit of wearing the hair of the head and the beard long give them almost a savage aspect. The Moldavians, preserving apparently better than the Wallachians the influence of the nomade condition originally common to both, are particularly attached to the taking of long journeys on foot. United in immense caravans, they roam over an immense extent of territory, transporting, in the vehicles shown in our engraving, provisions and a variety of useful articles to the cities scattered about the vast plains of Moldavia. Day by day they move cheerfully on to the slow measured sound of the footsteps of their oxen, being sometimes an entire month without seeing a single human habitation. At the approach of evening the caravan is stopped, the numerous waggons disposed in the form of a square, and the oxen left at large to graze under the watchful care of the intrepid dogs who accompany the caravan. In the middle of the square a fire is now lighted, at which the conductors prepare their simple repast; that over, each one disposes himself for sleep, sheltered by a warm and heavy coverlid that completely enwraps him. These indefatigable walkers are no less excellent riders; they possess towards the north of the principality a fine race of horses, which are much sought after. We may remark, in conclusion, that one of the greatest obstacles to the rapid increase of the trade and commerce of Moldavia is the state of the ways. There are no great highroads: the plain is open, and each traveller chooses his path. The lighter vehicles of the country, drawn by swift horses, cut the distance in a straight line, whilst the heavier follow a more carefully selected track. Storms of wind, rain, or snow make the matter still worse; at such times if there is a passage at all it can only be achieved by great patience and resolution.

HISTORY OF A COAT.—No. II.

[Continued from No. 539.]

Although there are many species of animals whose wool is susceptible, in some degree, of the process of felting, yet sheep's wool is the species almost universally employed in the production of what are termed woollen fabrics; so that the details relating to the woollen trade and manufacture in England are to be deemed as applying to the wool of the sheep.

It will be desirable to explain what is meant by *felting*, before we proceed to the detail of the cloth manufacture. If we inspect a piece of good broad-cloth, we perceive that it presents a texture strikingly different from that of linen or cotton: a slight downy appearance, called the *nap* or *pile*, so completely conceals the threads, that it is by no means apparent that the cloth is woven at the loom. Yet the manufacture, up to a certain point, very much resembles that of linen or cotton, and the change takes place when, after the weaving, the minute fibres of the woven threads are worked up by a species of friction, and then matted or twisted together into that particular state constituting the nap. Now this could not be done unless the fibres had the property of curling and interlacing among each other; but among the various fibrous substances which the animal and vegetable kingdoms yield, sheep's wool is one of the few which possess this property. This peculiarity has been known for ages; but its cause has only been recently discovered. The Tartars are accustomed to place a layer of moistened wool on the ground, and then to beat and press it until the fibres interlock among each other so as to form a continuous substance, which serves them as a carpet, or as a covering for their tents. A somewhat similar plan was practised in the Isle of Skye when Pennant visited it about sixty years ago: a number of women seated themselves on a bench, and felted a quantity of wool by rubbing and beating, first with the hands, and then with the naked feet. That a tolerably firm fabric may be produced by these means is proved from the fact that the felt of which the foundations of beaver hats are made is produced nearly in the same way, that is, by working moistened wool with the hand. After wool has been spun into thread, and then woven into cloth, it still retains the felting property; so that if the fine fibres can be worked up from the thread in a series of points, and then rubbed or pressed backwards and forwards, they will unite and form a kind of felted envelope to the woven threads; the working-up of the fibres is effected by the process of *teazling*, and the rubbing or felting by that of *fulling*, both of which we shall hereafter describe.

Many theories have been formed respecting the felting property of wool: some persons think it is due to the attraction of cohesion; others attribute it to the bending of the fibres by the beating with the fulling-hammer; but M. Monge, a French chemist, supposed that there were projecting filaments or serrations on the surface of each fibre, and that the serrations of adjoining fibres locked or fastened into each other. Experiments were therefore made with the microscope, in order to detect the existence of any irregularities in the surface of the fibres; but all these experiments were unsuccessful, until the year 1835, when Mr. Youatt succeeded in demonstrating the existence of the tooth-like projections. With a magnifying power of three hundred (linear), he found that a fibre of Merino wool appeared of a pearly grey colour, darker towards the centre, and having faint lines across it; that the edges were evidently hooked, or rather serrated, like the teeth of a saw; that the fibre was one seven-hundred-and-fiftieth of an inch in diameter; and that there were about two thousand four hundred serrations, or teeth, in a longitudinal inch. It was found that different qualities of wool had different numbers of serrations in a given length; and there is the strongest reason for believing that the felting property of different qualities depends principally on this difference of number. It will not be difficult for the reader to conceive how the serrated texture of the fibres enables them to lock or cling together by rubbing or beating; we will therefore here quit this part of the subject, referring to 'Penny Magazine,' vol. viii., p. 202, for further details.

There are, in former volumes of this work,* several articles which, taken collectively, will convey a sufficient idea of the species of sheep most fitted for producing fine wool, of the management of the large flocks of Merino sheep in Spain, and of the process of shearing, as performed both in Spain and in England. We will therefore take up the subject from this last-mentioned point, and suppose the wool to have been transferred from the sheep-proprietor to the wool-stapler or dealer.

Wool is distinguished as long or short. Long wool, called also combing-wool, varies from three to ten inches in length in the fibre; it is combed out into horizontal fibres, and then worked up into hosiery, waistcoating, carpets, bombazeens, crapes, poplins, &c. Short-stapled or cloth wool varies in length from three to four inches, and is used for broad-cloth, such as is employed for the making of a coat; the latter kind is therefore that to which our attention is here directed. The sheep, in its natural state, secretes a kind of grease or yolk, formed of potash and an oil, which remains in the fleece; this grease serves, with the aid of water, to form a kind of sud or lather, by which the wool is cleansed before it is sold. In some breeds of sheep the washing takes place before the shearing, cold water being employed; but where the fleece is thick, the wool is first sheared, and then washed in warm water. So much grease and other impurities are contained in the fleece, that it loses more than one-third of its weight by washing. The wool is sometimes washed a second time, in order to free it as much as possible from grease and dirt. We may here observe that the price of wool varies, according to its quality, from 1*s.* 6*d.* to 8*s.* per pound, and that the weight of a fleece varies from two to eight or nine pounds, the short-stapled fleeces being the smallest in weight.

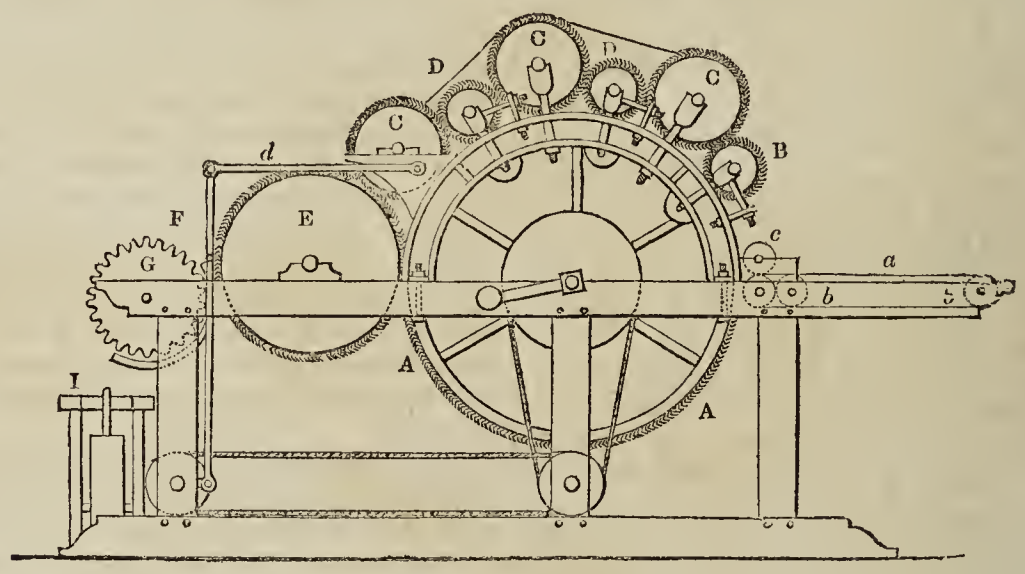
When the wool is brought to the factory, it is further cleansed in a machine, called by the various names of the wool-mill, the willy, the willow, or the devil. The object of this process is to disentangle the fibres one from another, and to cleanse them from sand and other loose impurities; and the mode of affecting it has varied according as new modes of applying machinery have been adopted. One description of the willow is as follows:—A hollow cylinder or drum, about three feet long and two and a half feet in diameter, has five small rollers working on its circumference and parallel to its axis; and the surfaces of the rollers, as well as of the cylinder, are covered with teeth or spikes. The whole of these revolve on their axes, a case or box encloses them, and a quantity of raw wool is put in at an opening in this box. By the rapid rotation of the cylinder and the rollers, the wool is dragged from tooth to tooth, by which it is opened, the longer fibres broken, and the sandy impurities separated. After a certain number of revolutions, a door is opened at the lower part of the machine, and the cleansed wool is thrown out by the centrifugal force of the cylinder. Another supply is then put in, and the same process is repeated. More recently a willowing-machine has been introduced, by which the process is performed more conveniently; the wool is placed on a continuous travelling apron near the upper end of the machine; it is from thence drawn into the smaller end of a conical barrel, and by the revolution of this barrel is gradually forced towards the larger end, in obedience to the well-known effect of centrifugal force. The exterior of the cone and the interior of the case in which it is held are studded with pins, and the wool, being caught between these pins, is disentangled and cleansed in the way before alluded to. When it is cleansed, the wool

* Vol. i., p. 128; vol. iii., p. 456; vol. viii., pp. 202, 391.

is thrown out on another endless apron; and at the same time a fan or blowing-apparatus is so arranged as to extract almost every particle of dust from the wool. Where the machine is of a less perfect construction, coarse wool is sometimes passed through the willow twice or thrice; it will, however, be sufficient for the reader to understand that in whatever way the process of willowing be performed, its object is to disentangle, in some degree, the fibres of the wool, and to separate from them any loose impurities.

The fibres are thrown together, by the process just described, in a confused and disorderly manner; the next process is intended, therefore, to arrange them in a broad thin fleece or lap. This process is called scribbling, and is effected by the scribbling-machine, which consists of a large central cylinder, having smaller ones on the exterior surface. These cylindrical surfaces are covered, not with pins, as in the willowing-machine, but with bent wires, similar to those employed in the carding-engine. The larger cylinder rotates with great velocity; its surface is covered with wool, which is laid pretty evenly upon it; and the wires on the smaller cylinder (called workers and clearers) catch the fibres, a few at a time, from off the wires of the larger one, and thus obtain a layer of fibres, much more light, open, and regular than that which covers the larger cylinder. After the wool has passed between three or four pairs of workers and clearers, it is taken up on the surface of another cylinder, called the doffer, and from this it is removed by a sort of comb, which yields it in the form of a continuous fleece. The smaller cylinders are arranged in pairs round the larger one, in such a manner that the workers take the fibres off the larger cylinder, the clearers take them from the workers, and the doffer finally removes them from the clearers. This operation is performed once, twice, or three times, according to circumstances. The arrangement of the scribbling-machine will be better understood from an engraving of the wool-carding engine, which it somewhat represents, so far as regards the bent wires fixed on the surfaces of the various cylinders.

The scribbling-machine leaves the wool in the form of a broad thin fleece or lap; and in order to carry it one more stage towards spinning, the fleece must be separated into narrow and tolerably regular bands or slivers. This is done by the process of carding, in which important improvements have been made of late years; for the carding of wool, like that of cotton, used to be effected by hand-cards, that is, pieces of wood with bent wires fastened into their flat surfaces. From that primitive form many deviations were gradually made, and the wool-carding engine at length assumed the form represented in the annexed cut. This cut presents a section at right angles to the



axes of the cylinders. The wool is laid by hand, as evenly as possible, on an endless apron (*a*), stretched round two rollers (*bb*); by the rotation of the cloth apron the wool is introduced between the feed-rollers (*c*), and from thence passes to the surface of a large cylinder (A), whose surface is covered with cards or bent wires (to prevent confusion in the cut, only the lower half of these wires is represented). The wool is then transferred to and fro in a singular manner; first from the great cylinder to one of the workers (C), then from the worker to the adjoining clearer (D), and from thence again to the larger cylinder (A). Every worker and every clearer is supplied with wire teeth, so that the filaments of wool become separated and drawn out, by being repeatedly drawn from the teeth of one cylinder to those of another, during nine or ten transfers. The cylinder marked E is called the doffer, and strips off the carded wool from the large cylinder. F is a vertical steel comb, which has a motion of such a kind imparted to it that it strips the thin fleecy web of wool from off the doffer. In the scribbling-machine the fleece is wound continuously on a revolving roller; but in the carding-machine the wires are so arranged on the surfaces of the cylinders as to separate the fleece into strips a few inches in width; and after these strips have been removed from the doffer by the steel comb, they are caught in the grooves of a fluted cylinder (G), which is partly enclosed in a concave case. The effect of this is, that the narrow bands of fleece assume the form of cylindrical rolls, which fall on an endless cloth connected with the apparatus (I) beneath the fluted roller.

In allusion to the effect of this process, Dr. Ure observes, "Carding opens up and separates the woolly filaments; renders the fleece lighter and more equable and homogeneous; it occasionally breaks the fibres in disentangling their connections, multiplies their fibres, and, by giving them a bristling and downy texture, renders them more disposed to agglomerate in the fulling process. By carding, wool expands greatly in its dimensions; the short broken filaments get crossed in every possible direction, and are ready to lay hold of one another, constituting the most favourable condition for being fulled. As the fibres of wool are more tortuous, elastic, and stiff than those of cotton, they require in their carding-apparatus not merely a main cylinder with card-teeth, but a series of smaller ones riding upon and embracing it, for alternately taking off and returning the wool, so as to open it sufficiently without breaking it to pieces, and to lay the fibres at every imaginable angle to each other."

The state in which we here leave the wool on which we are engaged, is that of a light and delicate roll, about twenty-eight inches in length and half an inch in thickness.

[To be continued.]

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BRITISH AGRICULTURE.

SEPTEMBER

[Emblems of September.—From Saxon Calendars. Hunting Swine; Cotton MS., Tib., B. 5. Threshing; Lansdowne MS., 381. Gathering Grapes; Cotton MS., Nero, D. 4. Pressing Grapes; Lansdowne MS., 383.]

In most parts of our island this month may be considered the season that the crops of grain are commonly cleared off the lands, and stowed away in the stack-yard, barn, or granary. In the arable districts the tawny and rigid stubbles impart to the fields a sterile appearance; but soon the plough is again at work, and the stubbles disappear beneath the recently turned furrows, for preparations even thus early are commenced for a new succession of crops. But the crops of potatoes, carrots, mangel-wurzel, cabbages, &c., are few of them yet quite ready for being gathered in; while many of the turnips, that form so prominent and conspicuous an item in the farmer's list of crops, continue to occupy the ground into the depth of winter; and some of them even through it; yet as those that may be considered the staple productions of the soil, comprising the various kinds of grain cultivated amongst us, have by the close of the present month been secured, it is generally considered that the agricultural year terminates at the end of September. Indeed, in many instances, Michaelmas is the term when the old or off-going tenants give up possession, and the new or in-coming tenants enter upon their farms; though the custom in some places is to take possession at Lady-day; while elsewhere it is usual to enter upon new farms at mid-April, May-day, or even at Whitsuntide.

> 'At Michaelmas lightly new farmers come in,
> New husbandry forceth him now to begin;
> Old farmer still taking the time to him given,
> Makes August to last until Michaelmas even.
>
> New farmer may enter (as champions say)
> On all that is fallow at Lent Lady-day:
> In woodland old farmer to that will not yield,
> For losing his pasture, and feed of his field."*

There being now but little of 'champion' or open-field, to what existed in the days when our author composed his work, his allusions to this peculiar sort of farming can scarcely be considered applicable. However, where open-field is still allowed to exist, the off-going tenant, agreeably to ancient custom, still allows the in-coming one to fallow that portion of the land intended for the reception of crops usually termed "winter grain," that is, wheat and rye principally; whereas the off-going tenant continues the occupancy of the grass-lands as well as the wood-lands, until the full expiration of his term, unless particular stipulations to the contrary have been inserted in the lease. In most of the grazing districts the off-going tenants yield up possession of the ground at *new* or *old* Lady-day, according as the custom of the country may be; that is, on the 25th of March, or the 6th of

* Tusser, 'September's Husbandry.'

April, whilst the dwelling-house and out-buildings are kept possession of until the 1st or 13th of May—*new* or *old* May-day; and even, in some instances, until Whitsuntide, which occasionally does not take place until the 10th or 12th of June. It certainly seems somewhat remarkable that means have not been devised to assimilate the customs in respect to quitting and entering upon farms, between one part of the country and another; for the diversities are productive of much inconvenience.

When the corn-harvest is completed tolerably early in the season, the second crops of clover and other artificial grasses (except such as are left to ripen their seed) will be ready for cutting; but when the harvest is rather late, these second grass-crops have to be attended to during the time the harvest is in progress.

Since this is the season for the re-commencement of the ordinary routine of farming affairs, before we duly notice what may be considered as the more distinguishing features, we will refer to a few of what our friend Tusser calls "after-harvest matters;" observing, however, as we remarked in our last month's agricultural article, that in several of the upland and later districts the corn-harvest is usually in operation during the whole or the greater part of the month of September; and in late seasons a considerable portion of the crop has often to be carried home in October.

> "Now carry out compass when harvest is done,
> Where barley thou sowest, my champion son;
> Or lay it on heap in the field as ye may,
> Till carriage be fair to have it away."

Again—

> "Ere winter preventeth, while weather is good,
> For galling of pasture get home with thy wood
> And carry out gravel to fill up a hole,
> Both timber and furzen, the turf and the coal."*

One of the earliest of "after-harvest works," the utility of which appears not yet sufficiently appreciated, ought to be that of cutting the haulm or stubble, particularly upon such lands as are intended to be ploughed before winter sets in; and as it is an operation that requires no particular degree of nicety either in the mowing or the raking, boys who are stout enough to wield a scythe are frequently employed in this way; so that while it affords them a little work, the farmer effects a saving by getting the work done at a lower rate than where able-bodied labourers are employed. When the stubbles remain upon the ground until late in the winter, as many farmers allow them to do, the action of the weather will have had such an effect upon them, that the stalks become so brittle as mostly to break off in the raking them together; and though this may consequently prove a saving of labour, on the whole it is but an unprofitable and slovenly plan; since the haulm, whether intended for littering farm-stock, or simply for conversion into manure, will be found of much less value in this condition than when cut and stacked soon after harvest is over. Since wheat-stubbles are, and always have been where this practice prevailed, those that are chiefly cut for the sake of the haulm, and since it appears, from some of Tusser's remarks, that barley was commonly sown upon lands which had produced wheat the preceding year, the manure or "compass" which the poet refers to for the barley crop was most probably applied to the stubbles that were ploughed up immediately after harvest. This system, indifferent as it is, is still pursued in several parts of the country; but where the turnip culture generally prevails, we find a more profitable mode of management almost universally adopted. And yet we have known farmers who not only managed to keep their land in good condition, but at the same time realised considerable profits, from pursuing a system that has generally been thought but an indifferent one, their rotation of crops being wheat, barley, and clover, allowing the latter to stand one or two years, as might best suit their views.

Probably there is nothing connected with agriculture generally that varies so greatly as does the rotation of crops; for although it is pretty much the custom for farmers living in the same vicinity to crop their lands something after the same fashion, yet in parts of the country distant from each other, though the soil and general characteristics of the farms should be exactly similar, quite opposite or dissimilar systems of cropping will be found to prevail. Sometimes we find that a rotation of crops will extend through as many as eight or ten years:—thus, fallow, wheat, barley, peas, turnips, barley, clover (one or two years), and wheat again. In other places we have witnessed, turnips, barley, clover and rye-grass, wheat, turnips, barley, trefoil and rye-grass, wheat, and oats. Then we sometimes find in situations precisely similar to the last, a rotation of crops extending through but five years, thus:—turnips, barley, clover, peas, and wheat; or turnips, barley, clover, wheat, and barley. Other farmers again adopt still shorter rotations; that which used frequently to be called the Norfolk culture, and which is, on soils adapted for the production of such crops, undoubtedly an excellent one, embraces a rotation of four years, thus:—turnips, barley, clover, or clover and rye-grass, and wheat; and in sections of country where wheat is but little cultivated, we frequently find this rotation still existing, though a very poor one, namely, turnips, barley, and clover, the clover being permitted to stand two years. In other situations we find even shorter rotations than these; for upon some rich and strong soils we find the farmers raising wheat one year, and beans the next, and so on through an indefinite number of years; while upon indifferent soils (particularly when corn sells at a low rate, and where manure is scarce) the farmers sometimes adopt the system of fallow one year and wheat the other, and so on alternately, preferring this (apparently) bad course of cropping so long as the price of wheat continues low; but when it attains what they consider a remunerating price for extra labour and expense being bestowed upon it, they then change their system, fallowing but once in three or four years; and yet, in the long run, most of them consider the other mode the more profitable one, notwithstanding the bad reputation of farms that return but one profit in two years. These that we have enumerated are but a few of the numerous systems, or rotations of crops, which we find adopted by the agriculturists in various parts of the country; and to pronounce upon them, respecting which system is the best, and which the worst, would be assuming to ourselves opinions upon which the most experienced and renowned agriculturists materially differ. Where the largest amount of valuable products can be had from the land in a certain number of years (not perhaps a very limited one), at the smallest expense of money and labour to the farmer, without impoverishing or otherwise reducing or injuring the soil, that, of all others, ought to be adopted where there was nothing to prevent its being carried into successful operation.

In those parts of the country where wood still forms a principal part of the fuel for winter consumption, there can be no doubt of the propriety of getting it brought home and properly stowed away before winter sets in; for to be under the necessity of carting faggots or any other heavy loads across the ploughed lands or meadows after the ground has become thoroughly soaked and saturated with autumnal and winter rains, is what no provident and clear-sighted farmer ought ever to permit circumstances to compel him to do; and if he volunteers the excuse that he had relied upon the frost setting in before the period that such things were actually wanted, this would only tend to prove that he was willing to put off the performance of these things at a time which he

* Tusser, 'September's Husbandry.'

knew to be the proper season, and thereby risk the injuring of his fields and meadows to so uncertain an occurrence as that of a hard and an early frost. "Let not thy work drive thee," is an adage that applies with peculiar applicability to the husbandman or farmer, and yet how frequently do we find it utterly disregarded, and the matter totally reversed; for nothing is so common a sight as that of witnessing farmers ever in arrears of their work.

Having introduced the subject of using wood for fuel, a fitting opportunity presents itself for entering our protest against the practice of lopping off the branches, or what is called polling trees. This custom is scarcely ever resorted to in any of the midland, nor in many of the northern counties; and although the greater abundance or rather cheapness of coals may in some measure account for the absence of this abominable system, yet when in various parts of the country we find the facilities of procuring other substances than wood for fuel greatly extended and still extending, and still see the old and pernicious practice of lopping the branches off the trees once in every six, eight, or ten years continued, we scarcely know how it is to be accounted for. In many of the south and south-eastern counties, and indeed south-western counties too, so completely is the timber ruined, or otherwise most seriously injured, not only the trees planted in the hedge-rows, but elsewhere about the farms, by the farmers lopping off the tops and thereby converting them into ugly and stunted pollards, or by leaving the centre stem and lopping away all the collateral branches, that it seems very extraordinary that the owners of the estates should not have long ago put a stop to it. That there should always be more or less refuse wood and faggots for fuel on every farm of any considerable magnitude, is a very desirable thing; but if the hedges in their annual dressings, prunings, and repairs, and the copses, together, do not yield a necessary supply, these faggots, which may generally be purchased at a reasonable rate, ought to be provided in the proper season; but by no means would we have the healthy and vigorous timber-trees resorted to for a supply of fuel, for besides their being greatly disfigured by their being lopped and cropped, a very considerable loss accrues in consequence of the quality of the timber being thereby injured.

In many parts of the country the farmers are in the habit of supplying themselves with coals for fuel at the market-towns whither they are in the habit of sending their teams with their corn to market; so that but little loss of time, and no extra journeys, are allowed for the carting of the annual supply of coals. But where this cannot be practised, and where coals are not to be had at convenient places for bringing home as return loads, then advantage should be taken of some leisure season, such as often occurs immediately after harvest, for laying in the necessary supply. There are other districts of country where turf forms the most considerable portion of the fuel consumed in farmhouses; but in those situations the farms are few of them arable, the presence of peat soils indicating moist and meadow lands; and there the principal season for turf-digging is during the months of May and June.

From Tusser's works, as well as several other old writers upon agriculture, we have reason to believe that two or three centuries ago it was an almost invariable custom to manure the land as soon as the crops had been removed, under some such impression as this—that it was but treating the soil fairly to return it an equivalent for the produce that it had just been deprived of; and remnants of this old custom we still find existing in several places where improvements in farming, as well as in everything else, make remarkably slow progress. It has already been explained, when speaking of manures, that a long exposure to the effects of the atmosphere is exceedingly injurious to vegetable manures in general; but as respects some mineral manures, such as chalk, marl, and gypsum, when they are laid upon the land in bulk, that is, without being broken fine or reduced to powder, a long exposure is absolutely necessary in order to extract from them those properties that improve vegetation. Should stable-manure or any sort of ordinary compost be spread upon stubble lands and immediately ploughed under,—when the same ground is next ploughed, which in most cases will be long before the manure in question has imparted its beneficial properties to the contiguous soil, it will then be brought again to the surface, and there for a considerable time left exposed; whereby an absolute loss of a large portion of those good effects which might have been derived from it by a better mode of treatment, will necessarily be the consequence. But to cart it into large and compact heaps near to the place where it will ultimately be wanted, cannot be attended to at a more proper season than the present; for not only may larger loads be carried when the ground is solid and dry, and consequently the expense of carting will be lessened, but less injury will be sustained by the waggons or carts, as also by the roads, or the lands over which it may be necessary to convey it.

Though Popery had ceased to be in the ascendant at the period that Tusser wrote his 'Five Hundred Points of Good Husbandry,' and he himself was, no doubt, a staunch Protestant, the fasts and observances which the Romish church had imposed upon her followers were many of them adhered to, as the following, as well as numerous other passages in his works, clearly indicate. The following extract he styles "Laying in provisions for Lent;" and it must be admitted that he acts with considerable foresight, for he recommends this matter to be attended to so early as the month of August:—

> "When harvest is ended, take shipping or ride,
> Ling, salt-fish, or herring, for Lent to provide;
> To buy it at first, as it cometh to road,
> Shall pay for thy charges thou spendest abroad.
>
> Chuse skilfully salt-fish, not burnt at the stone,
> Buy such as be good, or else let it alone;
> Get home what is bought, and go stack it up dry,
> With pease-straw between it, the safer to lie."

It seems evident from the above quotation, that the quantity of fish of various sorts usually provided at the completion of harvest for seasons of fasting and abstinence so distant as the Lent of the following year, was far greater, and considered of far more importance, than is the case at present. In reference to the said quotation, Dr. Mavor says:—"It is greatly to be lamented, both on the score of health and policy, that Lent and fish-days are so wholly neglected by Protestants. It cannot be too often repeated, that the encouragement of the fisheries would increase and perpetuate our naval strength." That our fisheries should be properly cared for and protected, we most readily concede; but as the individuals employed in ordinary farm labour are few of them any longer boarded and lodged in the farmers' families, we confess we neither see the sound policy nor the general practicability of taking those annual excursions here recommended for the purpose of procuring large supplies of fish to be salted and laid up in store against the following winter and succeeding spring. The wholesomeness too of fish diet is a matter of considerable doubt, particularly where persons are exposed to constant and severe labour; and it is a well-known fact, that where persons have been driven through necessity to subsist entirely upon fish for a considerable length of time, that although their outward appearance may not have exhibited any indications of decayed strength or signs of emaciation, yet they have felt themselves so weak and enervated as to be altogether unfit for great exertion of bodily exercise. Neither do farm-labourers of the present day live so grossly or luxuriantly that occasional fish-days and fast-days are so necessary on account of their health: their

ordinary food is neither so rich, so solid, nor so stimulating as to require other means than their daily toil in order to ensure them a good and sufficient power of digestion.

> "Thy market dispatched, turn home again round,
> Lest gaping for penny, thou loseth a pound;
> Provide for thy wife, or else look to be shent,
> Good milch-cow for winter, another for Lent."*

Better advice than this could not be bestowed upon the farmer, that so soon as his business at market is finished, to "turn home again round;" for where we see the market-days made use of more as affording opportunities for debauching and carousing than for buying and selling, we should have little hopes of such farmers being punctual at rent-days and other stated terms of payment; and it is no less true, that care should be taken, as much as possible, not to overstand the market; for under every consideration connected with both buying and selling, a fair and regular market-price should be satisfactory to both him that sells and him that buys. But respecting the custom of providing a good milch-cow or two for the winter, however acceptable the matter might be to her who has the management of household arrangements and domestic affairs, the farmers of the present day are often averse to agreeing to a proposal so reasonable. For our own part, we entertain the opinion, that even where the dairies are rather small, not to have a single cow calving in the autumn, so as to be in full milk during the winter months, is a piece of parsimonious and unaccommodating management. And yet it often happens that during the months of December, January, February, and frequently March too, that farm after farm might be visited without meeting with a single drop of milk in any one of their dairies. We must be understood as referring more particularly to districts of country where the lands are chiefly arable, or where the farms are of a mixed character; for upon grass-farms, although there generally is but a scanty supply of milk during the winter months, few dairies are ever suffered to be entirely destitute of that most useful family commodity. Families in the possession of dairies, if they are good managers of their domestic affairs, will invariably take care to salt down their winter supply of butter during the latter part of the present month, and through the greater part of October, since the weather about this period usually becomes so cool, that the butter is harder and better to manage; and the autumnal rains have commonly had the effect of reviving the scorched and withered summer grasses of the pastures and meadows, so that the quality of the butter made at this particular season is generally considered of the very first order.

> "At Bartlemew tide, or at Sturbridge fair,
> Buy that as is needful thy house to repair;
> Then sell to thy profit both butter and cheese,
> Who buyeth it sooner the more he shall leese."*

To the very great convenience of the farmers, as well as to other producers of marketable articles generally, appointed fairs take place at certain seasons of the year for the sale of farm-stock, farm produce, or particular sorts of wares and merchandise. Sturbridge fair, here referred to by Tusser, is near Cambridge, and still a place where considerable business is transacted by the farmers of that and the adjoining counties: it is held on the 18th of September, and again a fortnight afterwards. St. Bartholomew's day is the 24th of August; but it should be borne in mind that the Old Style existed at the period Tusser wrote, so that, as well as every other fixed date which he alludes to, would fall nearly a fortnight later than they do at present. This, in great measure, will account for many of his remarks and references which appear somewhat earlier than the present seasons.

> "As oft as ye bargain, for better for worse,
> To buy it the cheaper, have chink in thy purse;
> Touch kept is commended, yet credit to keep,
> Is pay and dispatch him, ere ever you sleep."*

* Tusser, 'August's Husbandry.'

Amongst all the sound and wholesome advice with which our author amply supplies his readers, we know of none sounder or more to be commended than the above; for, as Dr. Mavor, in reference to it, very correctly observes, "The reputation of ready money and a faithful regard to engagements will always deservedly command the market."

> "At first hand he buyeth that payeth all down,
> At second that hath not so much in the town;
> At third hand he buyeth that buyeth of trust,
> At his hand who buyeth will pay for his lust."*

Among those that Tusser classes as "works after harvest," is that important business, at least to the farmers of particular sections of the country, namely, gathering in the crop of hops. In a few districts, extending to four or five counties, so many hops are commonly grown, that although the hop-grounds occupy but a moderate extent of the quantity of land in each farm (for few farms of any size are wholly devoted to hops), from the great care and attention necessarily bestowed upon their culture, and their far greater value, acre for acre, than other crops, hops command no inconsiderable portion of the husbandman's peculiar care.

> "If hops do look brownish, then are ye too slow
> If longer ye suffer these hops for to grow;
> Now sooner ye gather, more profit is found,
> If weather be fair, and dew off the ground."*

The hop-gathering, or hop-picking, as the harvesting of the hops is called, in very early seasons commences the latter part of August; but the present month may generally be looked upon as the regular season. Sometimes it extends into October. According to the advice of our poetical friend, they should be picked as soon as they are ready, "If weather be fair, and dew off the ground;" but were he alive to witness the present practice of hop-picking, he would find that neither rain nor dew (unless the weather should happen to be exceedingly wet) is allowed to put a stop to the hop-picking when once it has been begun. It is by no means laborious work; but it is considered of that importance, that the entire rural population is called out to assist in the hop-picking; and that class of persons found in country places which does not properly belong to the farming community, may frequently be seen repairing to the busy hop-gardens. Women and children, the whole families of the day labourers, look forward to this particular period as the most favourable and indeed often the only season for earning a little money that occurs during the year; so that among the poorer orders the hop-picking is the grand jubilee of the rural districts where hops are grown; and when the crop happens to fail, which is by no means an unfrequent occurrence, the loss extends to the working and humbler classes.

When the hops are considered ready for picking, the farmer prepares his hop-bins, his baskets, and his sacks, altogether forming a little camp in some convenient situation, and generally as near as possible to the growing hops. Generally the bins are rudely constructed, upright stakes, forked at the top, being driven into the ground, upon which horizontal poles are placed, about two feet apart, a coarse cloth being hung over these poles, and thus forming a place of deposit for the hops, something in the form of a deep manger, and of a sufficient length for a couple of persons, at the least, to pick by the side of each bin. Several people are employed in the various parts of the work; some in cutting off the bins or stalks near the bottom of the poles, and in lifting the poles afterwards out of the ground with an implement made for that purpose. Then the poles, with the bines still twisted about and clinging to them, are placed upon waggons and taken to the camp, where they are deposited and supplied to the pickers as fast as they require them. The pickers rest the poles sloping against the sides of the bins; and when they have carefully removed all the hops from the

* Tusser, 'August's Husbandry'

bines upon a single pole, the bines are thrown to one side, and other poles are stripped in the same way. The poles, where proper care is taken of them, are carted away and stacked; if under cover, so much the better. Care has to be taken to pick the hops as free from leaves and stalks as possible; for a neglect of this sort would greatly injure the quality of the hops, and considerably reduce their value in the market. In picking, the parties assort themselves into twos and threes, and thus work in partnership; often a mother and two or three children will occupy the same bin, thus forming a family compact. When the bins are full, or, probably, two or three times during the day, some person in authority, and whose business it is to superintend the whole process, empties the bins by measuring out their contents in bushels, both parties keeping an account or tally of the quantity picked daily; for the pickers are not paid for their work until the picking is over, when they deliver up their tallies, and are paid accordingly. In measuring them from the bins they are put into sacks, and straightway carted to the oast-house for the purpose of being dried, and afterwards put into bags and pockets.

Where hops are cultivated in considerable quantities, persons from a considerable distance will often repair to the scene of 'hop-picking,' since some districts of country require more pickers than are to be met with in their respective neighbourhoods; and hence at the commencement of the picking season considerable numbers of persons may be seen on the roads leading from the metropolis to the neighbouring counties of Kent and Sussex; some of them more for the sake of seeing the country and of enjoying a little amusing recreation, than with any prospect of saving money. Besides the chance it thus affords the poor families of earning a little money, the assembling together of so numerous a party as we often see in a large hop-garden, which is usually a scene of mirth and boisterous hilarity, makes the inhabitants of the hop districts accustomed to look forward to the hop-picking season with anticipations of peculiar interest. Unless the owner, or whoever superintends the picking, happens to be unusually morose and intolerant, the joke, the song, and a general round of jocularity, while all hands are busily engaged, are the order of the day among a large party of hop-pickers.

The price paid to the pickers varies from season to season; for, according to the nature and quality of the crop, on which depends the ease or difficulty of gathering the hops, the price for picking a score of bushels is regulated accordingly; for it is not customary to engage pickers by the day or the week, nor even to make any agreement respecting the rate at which they shall be paid, before the picking commences; and it is not until the work has considerably advanced, and the growers have had an opportunity of nearly ascertaining the quantity the crops are yielding, and of consulting together concerning the prices to be paid to the pickers, that the rate of wages is fixed upon and established. It is somewhat singular that this sort of uncertainty respecting wages should continue to be tolerated in the hop districts to the exclusion of all others; but the growers are rarely if ever induced to set the rate of wages for picking hops below what people commonly receive in the harvest time when employed on other sorts of work, so that on the whole pickers have little reason to complain.

There is scarcely a farm, even of moderate size, in the hop districts without its oast-house or proper building for the express purpose of drying hops; for to be dependent upon some neighbour's oast-house would subject the parties to frequent inconvenience, if not absolute loss. According to the size of the farm, or rather perhaps to the nature and capacity of the soil for producing hops, the dimensions and capabilities of the oast-house are generally regulated. Besides the number of drying-kilns, for there are often two or three in an oast-house, there is a room in which the hops are deposited when brought in from the field, and another where they are stowed away to cool for a certain time after they have been taken off the drying-kilns. As the drying is one of those operations which requires great care and proper management, for according as it is performed the appearance of the hops is altered for the better or the worse, a person is engaged to manage this process, on whose care and competence the owner is willing to risk his future interests. As it is necessary that the kilns should be kept going night and day, it may easily be imagined that the oast-man will have vigilant duties to perform, since his is a highly responsible undertaking, such as obtains for him a higher rate of wages, as well from his general knowledge of his business as from the severe nature of the duties attending it; for as long as the process is going on, he rarely leaves the oast-house during the week, nor sleeps but by short catches during the whole time. When the hops are sufficiently dry (and two sets of floors may be dried in the day of twenty-four hours each), they are removed to the cooling-room, where they are allowed to remain until they are sufficiently cool to be put into the bags or pockets; for if they were packed away so closely as is considered necessary while in a crisp and dry state immediately from the kiln, a large portion of them would crumble into mere dust and powder. But as soon as they are cooled sufficiently to have acquired a damp and clammy feel, they are then ready for the pockets, the filling of which is performed by treading the hops into them as firmly and compactly as possible, the mouths of the bags being sewed up immediately they are filled; by their being thus packed as close as possible, they retain their strength and colour much better than they would in a loose state.

Formerly many of the small hop-growers, who were not accommodated with oast-houses, were in the habit of drying their produce of hops in the sun; a rather precarious process, one would imagine, in so uncertain a climate as ours, particularly when we take into consideration the lateness of the season in which the process had to be performed, frequently after the autumnal quarter had commenced. The length of time necessary for drying them in this manner was such that the hops in a great measure lost that fine and rich flavour which it is so desirable they should fully retain. This sun-drying is now nearly if not wholly abandoned; and hence it may be remarked generally, that most sorts of vegetable productions dried in the sun, where a long exposure is necessary, lose much of their finer flavour and most valuable properties. Even as regards hay, it is a well ascertained fact, that after cutting the grass, the more speedily it is converted into hay the greater the quantity of natural juices that will be retained in it, and hence the better the nature and quality of the hay.

We have often conversed with persons, whom we considered generally well informed, in parts of the country very distant from where hops are commonly cultivated, and we have invariably found them entertaining the opinion that in the hop counties (as those are often called where the hops are grown) the farmers devote their entire attention to this particular culture; or that if some of them attempt any other sort of farming, it is quite of a secondary nature. This general want of correct information does not at all surprise us, for amongst the farming community we have been witnesses to such gross ignorance—or, to give it a milder term, such a want or absence of general information regarding the culture of the soil and the management of farming affairs in parts of the country at no great distance—that we ought not to be surprised when we find the husbandmen of Devon and Cornwall, and of Cumberland and Northumberland, in a state of comparative ignorance of the general products of the soil of the respective counties of Worcestershire and Kent. We therefore state it for the benefit of those who

may be ignorant of the fact, that in what may be considered the regular hop districts, take the farms generally, that we shall on an average find that farms containing a hundred acres have rarely more than one-twelfth or one-fifteenth of the whole quantity, that is six or eight acres, devoted to raising hops; whereas the great body of the land is cultivated for the production of other crops. Two of the chief reasons for this seem to be—the heavy expense attached to hop cultivation, and then the great uncertainty of raising a good crop, and a doubt of its ultimate value. Of the various expenses attached to a hop-garden, the following are a few of the principal ones: first, there is the preparation of the ground for the young plants, which is very considerable; for the ground ought to be perfectly cleared of stock and stone, and either ploughed or dug to an unusual depth, and supplied with an abundance of manure. Then there is procuring the young plants and planting them in a careful manner, and the various hoeings and dressings of the ground, and the trimming and the training of the young hops, during two seasons, before a single shilling is returned to the cultivator; and then only a small return need be expected, for they seldom yield much until the third year. Then a very considerable item of expense is incurred by the poles they require; and as a portion of them get broken and destroyed every season, a constant supply of new ones is annually necessary in order to make good and replenish the loss that has been sustained. An acre of hops requires, in the first place, three thousand poles or upwards; and unless excellent care be taken of them in putting them down, and taking them up, and stowing them away during the winter, five hundred new ones will be found little enough to recruit the old stock yearly, on a very moderate calculation, taking a considerable number of years into the account. Various causes operate to increase or lessen the value of the poles; but in many situations the poles requisite for an acre of hops will cost 25*l.*, 30*l.*, or even 40*l.* Should the crop succeed and come to perfection, there are the various expenses of picking, drying, bags or pockets, and the Excise duty to be extracted from the price which they may happen to fetch in the market. Farmers, therefore, who have no great deal of capital to speculate upon, are seldom so imprudent as to enter extensively into the cultivation of hops, where the failure of the crops for two or three years in succession would most likely incur a loss that would effect their ruin. It has been estimated that the expense of cultivating an acre of hops, rent, tithe, &c. included, amounts to from 25*l.* to 30*l.*; and although we are inclined to consider this by no means a high estimate, it would be an exceedingly difficult matter to ascertain the average expenses of hop culture, since we find some persons bestowing double the labour upon hoeing and dressing the crops, pruning them, supplying them with first-rate poles, to what we observe practised by others. Sometimes, however, the profits are enormous as an agricultural crop, for it is no uncommon circumstance to hear of an acre of hops yielding a clear profit of 30*l.* or even 50*l.* It is the unspeculative character of farmers generally, which deters them from entering more extensively in the culture of hops; for there is hardly an instance of an individual growing twenty or thirty acres annually who is not possessed of a large or independent capital.

Besides the use of hops in brewing, they produce a bitter infusion and a tincture which are valuable in medicine for complaints in the stomach. A pillow made of hops has been used with success to produce sleep, where opiates had failed.

The excise duty upon hops is 18*s.* 8*d.* per cwt., and collected from the grower. From this circumstance has arisen the practice of quoting the probable duty of all the hops grown in England as an index of the probable result of the crop. Weyhill fair, near Andover, is the greatest mart for hops in the country. In 1839 the duty on hops amounted to 357,489*l.*, of which more than one-half was contributed by the county of Kent: Sussex was the next in amount, and then Hereford, Hampshire, and Worcester. The whole amount of land under this cultivation in 1839 was 52,305 acres.

Though the cultivation of hops is at present so comparatively partial, being confined to a few districts of the kingdom by no means extensive, there can be little doubt, should circumstances ever occur to call for an extension of this species of agriculture, that they might be successfully raised in districts of the country where at present they are totally unknown; for there are many counties which possess both soil and climate that could not fail to bring the hop-plant to its full perfection, provided the necessary attention was bestowed upon it by the discreet husbandman. But as the demand is at present limited, and as the present markets have been long established, there is but little probability of the farmers of any new section of country attempting to compete with the original hop-growers; for farmers in general are as much opposed to frequent changes of cultivation as they are to removing from place to place, apparently remembering that

> "The stone that is rolling can gather no moss,
> Who often removeth is suer of loss;
> The rich it compelleth to pay for his pride,
> The poor it undoeth on every side." *

And again,—

> "A competent living, and honestly had,
> Makes such as are godly both thankful and glad:
> Life, never contented, with honest estate,
> Lamented is oft, and repented too late" *

The teazle or teasel, or fuller's thistle, is one of those productions of the soil, which, though commonly considered as belonging to a class of weeds infesting many of our crops, has been found of so much utility in our woollen-cloth manufactories, that more than a century ago it was found desirable for the farmers to turn their attention to its cultivation. But the culture of teazles, like that of hops, is still confined to particular parts of the country; and while the latter has so long been esteemed so useful and palatable an ingredient in malt liquor, that national beverage of Englishmen, the inventive genius of mechanism has not been able to furnish the woollen manufacturer with any implement or piece of machinery to supply the place of the heads of the prickly teazle. When our woollen manufactures were wholly confined, as formerly was the case, to a particular section of the country in the West of England (and hence the name "West of Englands" for our finest broad-cloths), a district of no very great extent, including portions of Gloucestershire, Wiltshire, and the adjacent parts of Somersetshire, the attention of the farmers in some parts of those counties was turned to the cultivation of teazles, a market presenting itself close at their own doors; and where, ever since, the teazle crop has continued to form an article of some importance with a considerable portion of the farming community. At length, however, rival woollen manufactures sprung up in Yorkshire, when, as was naturally to be expected, the culture of the teazle was introduced into that part of the country too; but even up to the present time the cloth manufactures of Yorkshire have greatly exceeded the supply of teazles produced in that neighbourhood, and hence a considerable quantity has annually been sent to the Yorkshire markets from the old teazle-producing districts of Gloucestershire and Somersetshire.

Teazles may be grown in almost any soil and situation, yet the best crops are commonly raised upon strong and good soils, such as are accounted the most favourable for the growth of wheat, and where the ground lies favourably for a sunny aspect. This plant is biennial, maturing

* Tusser, 'Good Husbandry Lessons.'

its seed the second year; and since the crop has to remain upon the ground until the plants have blossomed, though not until they have *quite* matured their seed, it may be considered as occupying the ground a couple of seasons, to the exclusion of other crops, except in cases where the teazle-plants are transplanted into ground from which an early crop of potatoes has been dug, which is not unfrequently the case.

As the cultivation of teazles is somewhat singular, and different from other farm-crops, and not generally understood by the great bulk of the farming community, a concise account of it may prove not uninteresting. In most instances old lay land, in preference to any other, is broken up early in the spring, and laid up in ridges of the width of six feet. After it has lain some time the surface of the ridges is levelled—righted, as it is called—with the spade; and afterwards, about the middle of April, the seed is sown, two pecks being sufficient for an acre, when it is lightly harrowed in with a bush-harrow. When the young teazles have acquired the size of small lettuce-plants (about the time they are usually transplanted), and which they a good deal resemble, the ground is carefully gone over with spades and hoes, in order to destroy the weeds, as well as to size out, that is, thin the plants until they are four or five inches apart. About a month afterwards they are worked in a similar manner; after which they require no more attendance until the autumn, when they are further thinned by drawing out all the plants which will not be required for the regular standing crop; the distance ultimately of the plants apart being fifteen or eighteen inches. The best of the plants thus drawn out are planted into some piece of ground already prepared, or else sold for the purpose of planting to some neighbouring farmer, at the rate of one shilling and sixpence the thousand. Twenty thousand plants will plant an acre, and the transplanted ones often succeed better than those that are left in the ground for a standing crop; being commonly, as previously observed, put into ground from which a crop of potatoes has recently been dug. During the winter care must be taken to keep the farm-stock from injuring the young plants; and about the month of March following they require gritting, that is, the soil has to be stirred with spades to the depth of two or three inches, in order that it may remain loose and porous around them during the succeeding months. In the latter part of April, or the beginning of May, the plants commence throwing out collateral branches, and again have to be worked with the spade in a similar manner to what they were early in the spring. After this the earth has to be hoed up around the stalks for the double purpose of nourishing and supporting them. They are then left to mature the crop, or until after they have blossomed, and the prickly seed-heads are in a fit condition for being gathered, which operation usually takes place during the month of August.

When the soil is in good condition and the season altogether favourable, teazles often grow to the height of four or five feet and upwards, but the most luxuriant crops in appearance seldom turn out the most valuable, since the burrs or seed-heads of such plants are seldom of so good a quality as those produced by moderately stout plants. A stout plant with sufficient room to throw out collateral branches, will sometimes produce eighty or a hundred burrs; but where the crops are but indifferent, eight, twelve, or fifteen is the ordinary number found on one plant. Teazles are on the whole a very precarious crop; for even if they escape all the dangers to which they are liable during the long period they occupy the ground, should the weather happen to be rainy about the period of their blossoming, that is, a short time before they are fit for harvesting, the whole crop is in danger of becoming absolutely worthless, for the burrs rot, and are not worth gathering. When the crop is considered at maturity, the burrs are cut separately, and each of them attached to a piece of the stalk of the length of eight or nine inches, for the purpose of their being tied together in handfuls, fifty or sixty making a handful. They are then fastened upon teazle-lugs, as they are named in Somersetshire, small poles of ten or twelve feet in length, and taken to open sheds or other convenient places to dry; but owing to their being cut while green, they still require considerable exposure to the wind and sun, as opportunities may offer, before they are in a fit condition to be laid up under cover.

The next thing to be done is the making out; but unless high prices induce the growers to set about this business at an earlier period, it is commonly deferred until the winter, when the farmers have more leisure to attend it. When this has to be performed, the teazles have to be untied from the poles they were fastened upon at the time of gathering, and thrown into a general heap; when the parties employed in sorting them part them into three lots of different qualities, which are known by the names of best middlings, small middlings, and kings, twenty-five going to the handful, and twenty handfuls making a stave. Small and straight sticks having been provided, each two and a half feet long, and three-fourths of an inch in diameter, and split within six inches of the lower end, the teazles are then arranged upon them as regularly as possible, for in this state they are put into the hands of the cloth-dresser. Forty of such staves in the west of England make a pack (in Yorkshire twenty-seven are reckoned a pack), so that a pack of teazles contains forty times five hundred, or just twenty thousand.

The market price varies greatly from year to year; for should there happen to be two failing crops in succession, the value of the stock on hand will be materially enhanced. In ordinary seasons the price may be estimated at from 4*l*. to 6*l*. the pack of best middlings; and the growers make their calculation thus:—that one-half of the crop is usually of this sort, while the other half consists of kings and small middlings; and these sell for only half the price of the best middlings. The kings are the large coarse burrs growing on the top of the centre stem, and are only fit to be used upon coarse cloths or blankets. The quantity produced upon an acre varies greatly, for sometimes fifteen or twenty packs (including the different kinds) are yielded; but frequently not more than one-third of that quantity. The expenses of cultivating a crop of teazles, gathering them, making them out, and conveying them to market, are very considerable; and when we take into the account that it requires two years (excepting transplanted crops) to arrive at maturity, unless the product be an abundant one, the grower stands but an indifferent chance of being remunerated for all his trouble. Those who cultivate them for the Yorkshire market, as many of the west of England farmers do at present, have to incur a heavy additional expense in conveying them thither; for they calculate that a single-horse cart-load from Bristol to Leeds costs about 10*l*. (the expenses of going and returning), the load containing nine packs of best middlings and twelve of small ones; and this quantity loaded upon a common cart gives to the load a far greater bulk than if loaded with hay or straw, the dry teazles being lighter than any other marketable article of farm produce. The time required for taking a load of teazles to the Yorkshire market from the north-eastern part of Somersetshire is fifteen or sixteen days, including the going and returning. At one period large sums of money were realised by a few speculators in teazles; for the produce being limited, they succeeded in buying up so large a portion of the produce for two or three years in succession, that they in a great measure monopolised the markets, and commanded what prices they pleased. But most of the farmers now who are in the practice of cultivating them, either dispose of their crops to the neighbouring manu-

facturers, or else employ their own teams, at the least busy season on the farms, in sending them to the Yorkshire market without employing any intermediate agent in the sale of them.

[Teazle (*Dipsacus fullonum*).]

MONTHLY CALENDAR.—OCTOBER—TENTH MONTH.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock aft. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h m.		h. m.	h. m.
1 TH	275	Pheasant shooting beg.	6 2	10 25	5 36	5·7	0a55	7a36
2 F	276	. . .	6 4	10 44	5 34	6·7	1 50	8 25
3 S	277	. . .	6 6	11 3	5 31	☽	2 33	9 27
4 *Su*	278	16 *Sunday after Trinity.*	6 7	11 21	5 29	8·7	3 5	10 37
5 M	279	. . .	6 9	11 39	5 27	9·7	3 28	11 52
6 TU	280	. . .	6 11	11 56	5 25	10·7	3 46	morn
7 W	281	. . .	6 12	12 13	5 22	11·7	4 2	1 5
8 TH	282	. . .	6 14	12 30	5 20	12·7	4 14	2 27
9 F	283	. [Terms beg.	6 16	12 46	5 18	13·7	4 26	3 46
10 S	284	Oxford & Camb. Mich.	6 17	13 2	5 16	14·7	4 39	5 6
11 *Su*	285	17 *Sunday after Trinity.*	6 19	13 17	5 14	○	4 54	6 30
12 M	286	[Old Mich. Day.	6 21	13 32	5 11	16·7	5 13	7 58
13 TU	287	. . .	6 22	13 46	5 9	17·7	5 40	9 28
14 W	288	. . .	6 24	14 0	5 7	18·7	6 17	10 56
15 TH	289	. . .	6 26	14 13	5 5	19·7	7 11	0a16
16 F	290	. . .	6 28	14 26	5 3	20·7	8 22	1 17
17 S	291	. . .	6 29	14 38	5 1	☾	9 44	2 0
18 *Su*	292	18 *S. aft. Trin. St. Luke*	6 31	14 49	4 59	22·7	11 10	2 29
19 M	293	. . .	6 33	15 0	4 56	23·7	morn.	2 51
20 TU	294	. . .	6 35	15 10	4 54	24·7	0 34	3 7
21 W	295	. . .	6 36	15 20	4 52	25·7	1 55	3 20
22 TH	296	. . .	6 38	15 29	4 50	26·7	3 13	3 32
23 F	297	. . .	6 40	15 37	4 48	27·7	4 30	3 44
24 S	298	. . .	6 42	15 44	4 46	28·7	5 46	3 57
25 *Su*	299	19 *Sunday after Trinity.*	6 43	15 51	4 44	●	7 2	4 12
26 M	300	. . .	6 45	15 57	4 42	1·1	8 18	4 31
27 TU	301	. . .	6 47	16 2	4 40	2·1	9 32	4 57
28 W	302	*St. Simon and St. Jude*	6 49	16 6	4 38	3·1	10 41	5 32
29 TH	303	. . .	6 50	16 10	4 37	4·1	11 41	6 18
30 F	304	. . .	6 52	16 13	4 35	5·1	0a28	7 16
31 S	305	. . .	6 54	16 15	4 33	6·1	1 5	8 22

Meteorological Averages.

Barometer.	Ins.
Mean height	29·774
Highest	30·610
Lowest	28·740
Hygrometer.	°
Mean dew-point	44·8
Highest	66
Lowest	32
Mean dryness	4·1
Mean greatest do. of day	4·5
Greatest dryness	15
Thermometer.	
Mean temperature	48·9
Highest	68
Lowest	27
Radiation.	
Mean great. of Sun	27·5
Greatest power	43
Mean cold of terrest.	4·8
Greatest ditto	11
	Ins.
Mean qty. of rain	2·073
Mean of evap.	1·488

Table of the Winds.

	Days.	Dew-P.
N.	3	38°·5
N.E.	3¼	41 ·5
E.	2	45 ·5
S.E.	3½	49
S.	2¼	53 ·5
S.W.	5¾	50 ·5
W.	5	46 ·5
N.W.	6¼	43

SUNDAY LESSONS.

Oct.		MORNING.				
4	16	S. af. Trin.	Ezek.	2	Mark	7
11	17	„	„	14	„	14
18	18	„	„	20	Luke	4
25	19	„	Dan.	3	„	11

Oct.		EVENING.				
4	Ezekiel	13	...	2	Cor.	3
11	„	18	...	„	„	10
18	„	24	...	Galat.		4
25	Daniel	6	...	Ephes.		5

THE MOON'S CHANGES.

First Quart. 3rd day, 5h.38m. aft.
Full . . . 11th day, 7h.14m. mn.
Last Quart. 17th day, 11h.38m. aft.
New . . . 25th day, 8h.58m. mn

Day of Mth.	Length of Day.	Day's decrease	Day breaks.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	
1	11 34	5 0	4 8	7 30	16′ 1″
6	11 14	5 20	4 17	7 18	16 2
11	10 55	5 39	4 26	7 7	16 4
16	10 35	5 59	4 34	6 57	16 5
21	10 16	6 18	4 42	6 47	16 6
26	9 57	6 37	4 50	6 37	16 7

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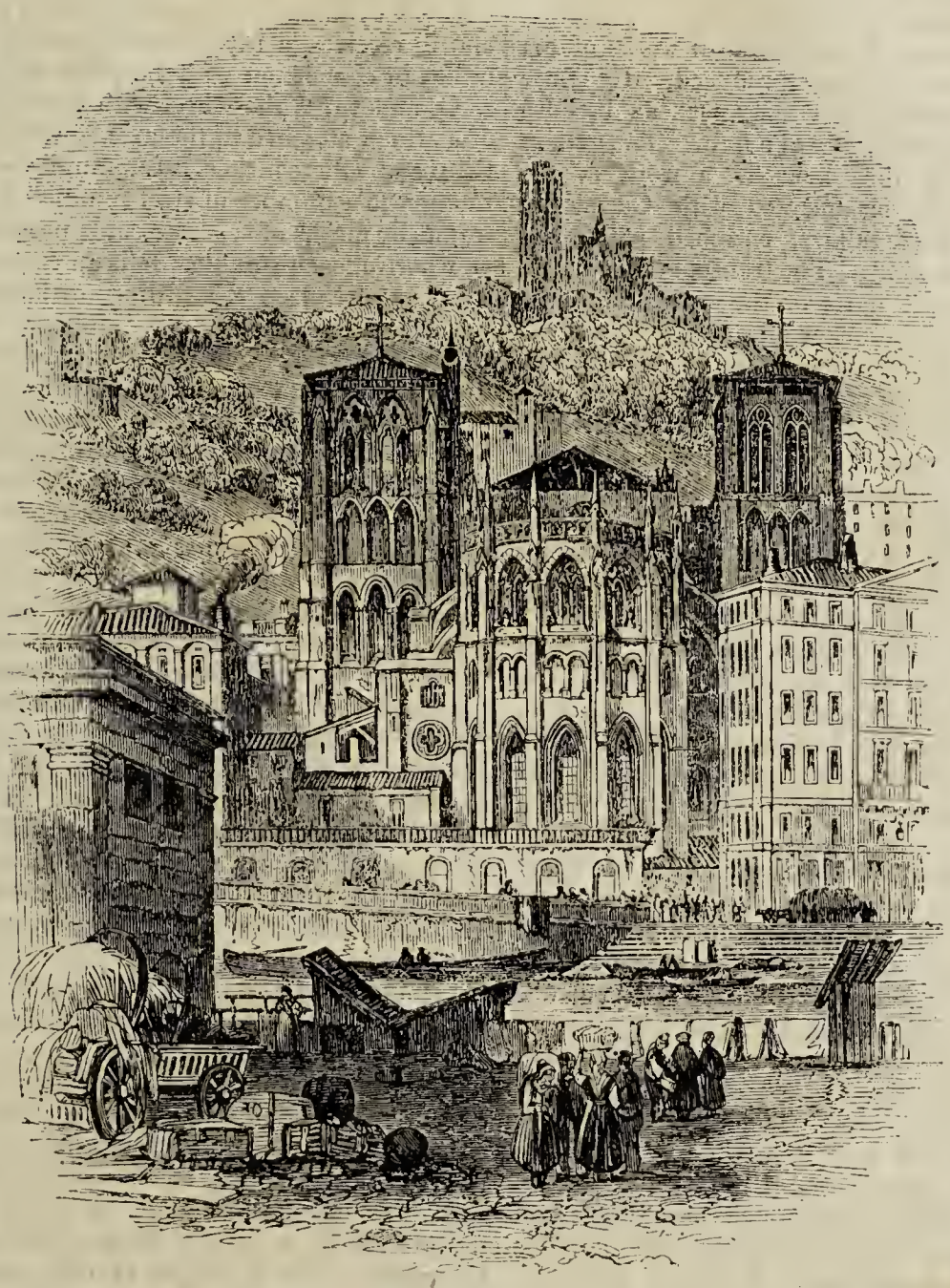
THE CATHEDRAL OF LYON.



[View of the Cathedral of Lyon, from the Rhône.]

The city of Lyon (commonly, but incorrectly, written Lyons) ranks next to Paris as the most important place in France. It is situated between the Rhône and the Saone, a little above their junction, in the department of the Rhône. But we propose here to treat only of the cathedral, which is dedicated to St. John, and is one of the most interesting and remarkable of the public buildings of the city. It owes its origin to a baptistery, founded here by St. Arège about the commencement of the seventh century, and dedicated to St. John the Baptist, which edifice was erected merely as an accessory to the church of St. Stephen, built here by St. Patient in the fifth century; but in the lapse of time it became itself the principal place of worship, and by the tenth century it ranked as a cathedral, forming the primatial church of the Gauls. It had been previously ruined, and repaired several times prior to the ninth century, at the commencement of which (during the reign of Charlemagne), Archbishop Leyderade once more re-established it, and deposited within its walls the relics of St. Cyprian, bishop of Carthage, and of other saints and martyrs. Between two and three centuries later, the present edifice was begun; and although at different periods the popes, the kings of France, the archbishops of Lyon, and the chapter, contributed towards the expenses, the cathedral was not finished as we now see it till the reign of Louis XI., in the fifteenth century. In this last rebuilding, blocks of marble and other remains from the ruins of the forum constructed at Lyon by the Roman emperor Trajan were used.

The western front is the most modern part of the cathedral. This has been praised by many for its magnificence, whilst by others it has been judged heavy in its general effect. There are three central doorways, varying in size, but similarly decorated with rich architectural ornaments, and above them is a very splendid rose or circular window. There are four towers, low, square, and somewhat heavy in their appearance, but richly sculptured. Three of them are deserted and entirely empty, but the

fourth contains one of the heaviest bells in the kingdom, weighing no less than 35,000 lbs. Two galleries, with open balustrades, extend all the breadth of the façade. The interior is simple in its general character; but the length of the nave, the elevation of the vaulted roof, the multiplicity of the columns, the richness of the sculpture, and the beauty of the windows, which admit only a sombre and mysterious light, give to the whole an air of majesty and grandeur which is frequently wanting in buildings more profusely decorated and of higher pretension. The nave appears to be of the thirteenth century, when Gothic architecture had arrived at its highest state of perfection in France, and when most of the beautiful works of art still existing in that country were produced. Its entire length is about two hundred and sixty feet, its breadth between the pillars thirty-six feet and a half. The gallery between the nave and the choir is a work of the last century only: it is ornamented with Corinthian columns, and with a frieze above, enriched with bas-reliefs of a very excellent kind. The transept and chancel belong to the more ancient parts of the cathedral: near the spot where the former branches off on each side of the body of the building, we find the great altar, which is only remarkable for the two crosses it bears, one at each extremity, and which were placed there in the thirteenth century, to preserve the memory of the union of the Latin and Greek churches, a measure decided on at a great General Council held in the cathedral in 1724. Along the aisles extend a suite of chapels, founded at different times by the archbishops and canons: among these the most worthy of notice is that which stands nearest to the entrance on the right, the foundation chiefly of Cardinal Charles de Bourbon, who was the archbishop of Lyon towards the middle of the fifteenth century. This is an exquisite specimen of the later Gothic, being particularly distinguished for the richness, variety, and delicacy of its ornaments: the foliage is peculiarly beautiful. Within the chapel we find the arms of the founder, and of his brother the duke Pierre of Bourbon, who, after the death of the cardinal, finding the work unfinished, undertook the care of its completion. An inscription on the side of the altar in this chapel apprises us that the heart of Cardinal Alphonse de Richelieu, archbishop of Lyon, was deposited there. But the famous clock, which is placed in the left arm of the transept, is, before everything else, the chief object of attraction to the numerous strangers who visit the church of St. John. This is certainly a very remarkable and interesting piece of mechanism, considering the period of its construction, 1598. It is built in the form of a square tower, surmounted by a dome, and loaded with a profusion of ornaments in the worst possible taste, the additions of a later age. It was a perpetual calendar, civil and ecclesiastical—a complete system of astronomy in action. It marked the century, the year, the day, the hour, the minute, the place of the sun among the signs of the zodiac, the phases of the moon, &c., &c. The mechanical effects which accompany the more useful movements of the machine are very singular: a cock, elevated on the summit of the dome, announces the hour by the clapping of his wings and by crowing; then a chime of little bells is heard to play the air of the hymn of St. John; and during this, several figures, animated by concealed springs, represent the mystery of the Annunciation, the whole being concluded by the clock striking the hour. The clock has been for some years out of repair. The original constructor was Nicolas Lippius of Bâle.

HISTORY OF A COAT.—No. III.

[Continued from No. 544.]

In our last paper on this subject we traced the processes through which short-stapled wool passes from the time it leaves the back of the sheep till it assumes the form of long cylindrical rolls about the thickness of the finger. These rolls, slivers, or cardings are taken up, one by one, from the apron of the carding-machine, by a boy or girl, and removed to another machine close by, called the slubbing-machine, or the slubbing-billy, where they are joined end to end in a continuous cord, called a slubbing. As the slubbing-billy was at one time the cause of much undeserved reproach against the factory system, we will illustrate its mode of action by a cut. (See p. 388.)

AA is a wooden frame, by which the other parts of the machine are supported. A moveable carriage DD runs from end to end of the frame, on small wheels, 1, 2. F is a hollow cylinder of tin-plate, about six inches in diameter; and it receives a rapid rotatory motion from a band and pulley in connection with the wheel E; the spinner stands at Q, and turns the wheel with his right hand, by means of a winch attached to the axle. When the cylinder F is rotating by these means, it communicates a still more rapid rotation to a number of steel spindles, 3, 3, set upright in a frame, by means of separate cords passed round the pulley or whorl of each spindle. B is an endless apron, on which a boy or girl places the cardings or long rolls of wool, side by side. The spinner, or 'slubber,' stands behind the moveable carriage, pushes it onward to the other end of the machine with his right hand, and then fastens the end of each carding to a spindle, there being as many cardings as spindles. The ends of the cardings pass under a roller C, and through the opening of a wooden clasp G. The spinner draws the carriage back about eight inches, carrying with it eight inches in length of every carding. By the action of a wheel, 5, connected with the carriage, on a lever and pin, 6, 7, connected with the frame, the clasp G is made to grasp firmly the several cardings, so that no more than the eight inches can be drawn out. The spinner then recedes to the end of the machine, drawing the spindle-carriage with him, and stretching out the eight inches of every carding nearly to the full length of the machine. As he recedes, he turns the wheel E with his right hand, and the rapid rotation which he thus gives to the spindles imparts a twist to the elongated cardings, thus giving them the first approach to the thread form. When this elongation and twisting are completed, the carding (now called slubbing) is made to wind conically on the spindles, by means of a moveable wire, 8, connected with a bar, 4. When this is done, the slubber moves the carriage to the other end of the machine, draws out eight inches more in length of each carding, and, by drawing the carriage back again, elongates those portions to the extent of several feet, and so on continuously. The reader will appreciate the action of this machine by remembering, first, that little rolls of wool, about half an inch in diameter, are placed at the left hand of the machine; secondly, that eight inches in length of each roll are drawn out to the extent of several feet, and slightly twisted; thirdly, that this continuous thread, or slubbing, is wound on spindles, which, when filled, are replaced by empty ones.

We have now to state that, although the cardings are only twenty-eight inches in length, the slubbing produced from them is continuous. This is effected by the boy or girl who attends the machine, and who, while laying the cardings on the endless apron, slightly unites the ends of one set to those of the set which follows; and as there are from fifty to a hundred spindles in each machine, the attendant must keep up a supply of cardings for all of them, just as fast as the slubber can spin them. Generally speaking, four attendants, called 'piecers,' are required to supply the cardings as fast as the slubber can work them. Unjust and cruel treatment towards these children was the cause, some years ago, of a great outcry against the factory system. The slubber was engaged at 'piece' work, and could work or not, as he pleased; if he chose to be idle for half an hour or an hour, a great accumulation of cardings from the carding-engine resulted, which the children were obliged to lay in heaps on the floor. When the man returned to his work, he

endeavoured to make up for lost time by redoubled exertions, the consequence of which was that the children could not lay the cardings on the endless apron so fast as he could use them; hence followed blows and cruel treatment, in which the 'billy-roller' (marked C in the cut) was often used as an instrument of punishment. It was proved before the Factory Commissioners that the master manufacturers totally discountenanced, as far as they could, this harsh and unjust mode of treatment; and so far from being a proof of the cruelty of the factory system, it proves just the reverse, since, if the movement of these machines depended on the steam-power which moves the carding-machine, instead of on the caprice of the workman, the irregular and unequal labours of the children would become regular and systematic, and each one would know precisely how much he or she had to do in a given time. This circumstance has been so strongly felt, that attempts have been, and, we believe, are being made, to connect the slubbing-machine with the carding-engine in such a manner that steam-power shall effect both operations.

When the wool has been brought to the state of slubbing, it is a loose kind of worsted thread, but with scarcely coherent strength enough to hold together. To reduce it still more in thickness, to twist it, and to make it tolerably hard and strong, are the objects of the next process—spinning. This process has already been described, in connection with the cotton manufacture;* and as it differs but very little, whatever be the material employed, a few words will suffice respecting the spinning of wool. There are two kinds of machines employed in spinning, viz. the jenny and the mule; but in each one the slubbing is held fast at one end, while the other, being attached to a moveable carriage or frame, is stretched or drawn out; while, from the rapid rotation of the spindles to which the wool is attached, the yarn becomes very much twisted, and thus considerable strength is imparted to it. Spinning is, in fact, a repetition of the process of slubbing; in the last-mentioned process, the cardings are elongated, and have just such a degree of twist given to them as will enable them to bear the strain without breaking; those slubbings which are destined to form the warp of the cloth being more twisted than those intended for the weft. In spinning, the slubbings are drawn out to about three times their former length, and a degree of twist is given to them proportionate to the purpose to which they are to be applied.

The materials for our coat are now in the form of yarn, or woollen thread (not worsted, as this is made of long wool, and has nothing to do with our present subject). The fibres of this woollen yarn are not so straight and regular as those of cotton yarn, since the former are purposely left somewhat entangled, in order to facilitate the process of felting or fulling. The yarn has now to be woven into cloth, and here again we may observe that the different material employed does not render the process very different from that of cotton-weaving. We will therefore refer to vol. ix., p. 45, for a few details respecting cotton-weaving, and here merely notice the points in which wool requires a modification of the process. Broad-cloths are sometimes woven to the width of twelve quarters, and must therefore require a very large number of warp-threads laid parallel to one another. This arranging of the threads is called warping, and is effected by means of a machine called the warping-mill. Continuous threads, about sixty yards in length, are wound regularly, and side by side, round a large reel. After a little subsequent cleansing and dressing, the yarn is wound on the warp-beam attached to the loom, and the process of weaving commences. Three thousand threads, laid side by side, for the warp, will make a piece of cloth about one hundred inches wide; and each thread, which is sixty-five yards in length at the commencement, contracts to about sixty-two during the process of weaving. The yarn which is to form the weft, or cross-threads, is of a somewhat different quality from that forming the warp; it is wound from the spindles of the spinning-machine on to the pirn or bobbin of the shuttle, one pound of weft being required for about a yard of cloth one hundred inches in width. In weaving woollen cloths, a few threads of coarse and strong yarn are laid at the edges; these form what is called list, and are intended to afford a firm hold for some hooks by which the cloth is stretched during a subsequent process; this list is considered as waste material when the cloth comes to be cut up for use. We must here remark that the use of such enormous widths as twelve quarters (three yards) is owing to the shrinkage occasioned by the subsequent fulling process: cloth which is twelve quarters in width when it leaves the loom, is but little more than six quarters when ready for sale.

In the manufacture of cotton, silk, or linen, when the weaving is finished, the range of processes has approached nearly to an end; but in the woollen manufacture the case is far otherwise; that peculiar texture which we call the nap or pile requires many nice processes for its production. The appearance of the cloth when it leaves the loom may be easily conceived; all the threads are visible, but they have a more hairy or fibrous appearance than those of cotton, silk, or linen; and these fibres, still further loosened and worked up, subsequently form the nap or pile, after the various processes of scouring, fulling, tentering, burling, milling, teazling, shearing, &c.

As a considerable quantity of oil is used with the wool in the early part of the manufacture, this oil must be removed after the weaving by the processes of scouring and fulling. The cloth is steeped for three or four hours in an alkaline mixture, and then removed to the fulling-mill, where it is beaten for two hours. The cloth is put into a kind of trough, and two fulling-stocks (which are large wooden hammers) continually beat against the cloth, turning it over and over in various directions. The handles of the hammers are several feet in length, and are fixed in an inclined position, so that, by the action of steam or of a water-wheel, the mallets or stocks fall with great force against the cloth. A constant supply of water is flowing through the mill, carrying with it the grease and other impurities. Sometimes soap is employed to assist the removal of the grease; but, whatever be the detergent employed, the cloth is afterwards fulled a second time in clear water. This series of tossing, rubbing, and beating for three hours, has the effect of removing all the grease, and of partially felting the cloth, that is, its appearance is midway between that of a woven tissue and of a felted cloth.

The next process is that of tentering, or stretching the pieces of cloth in the open air. The tenter-frames consist of a number of vertical posts fixed in the ground, with a continuous horizontal rail fixed on their tops. Other horizontal rails are fitted between the upright posts, in such a manner as to slide freely up and down, and can be fixed at any distance beneath the upper rail by means of holes and pins. Tenter-hooks are driven into the upper and lower horizontal rails, and on these the list of the cloth is fastened; by lowering the bottom rail, the cloth is stretched to its full extent, and is then secured by pins. Here the cloth is left, exposed to a free circulation of air, until dry.

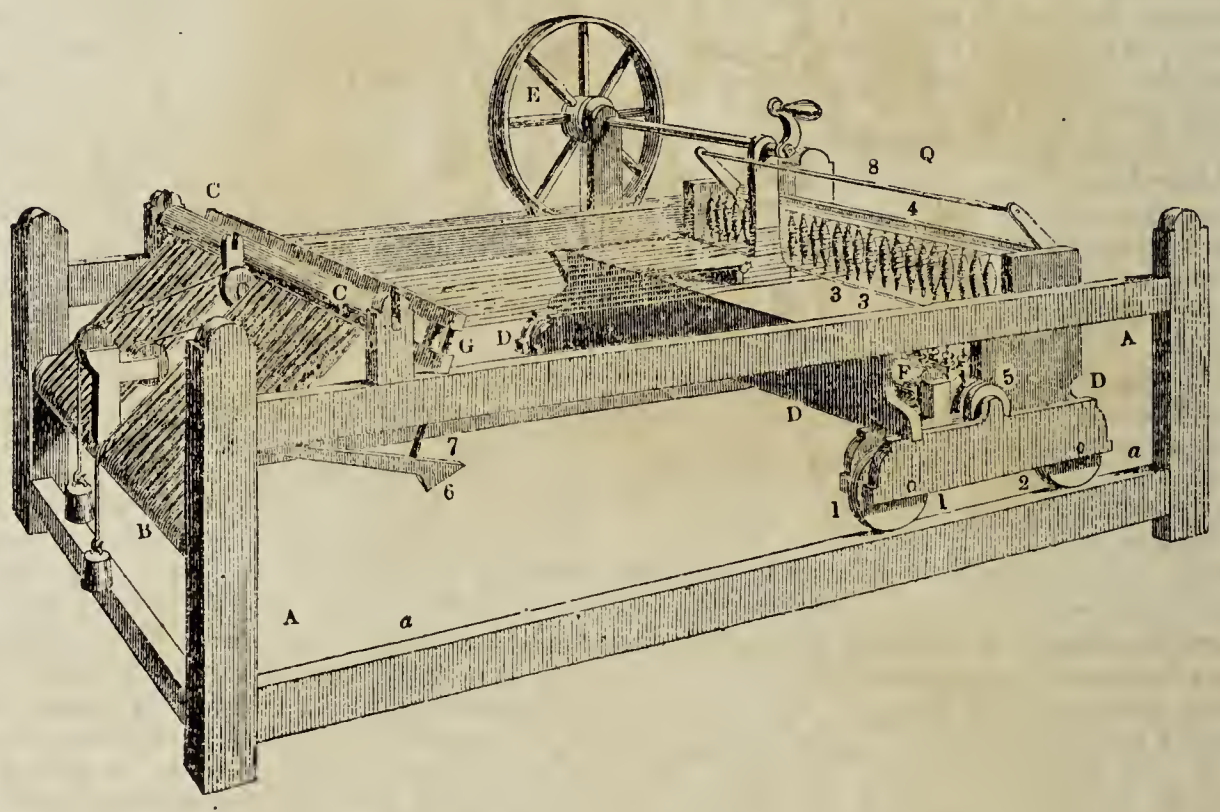
The process of burling succeeds that of tentering, and consists in a minute inspection of every part, in order that all knots and uneven threads, or extraneous matters, may be removed; any rents or defects which may be found, are repaired by introducing fresh threads. No such process as this occurs in the cotton manufacture, for two reasons: first, there is no beating process, such as the fulling of woollen cloth, which is very likely to produce holes and defects; and, secondly, there would be no means of hiding the mended places. In the cloth manufacture, the milling operation, which follows the burling, entangles

* 'Penny Magazine,' vol. v., p. 268.

the fibres of the repaired spots in such a manner as to conceal the defects and give the whole a uniform appearance. In the operation of burling, the cloth is spread out flat, and the burlers, generally young women, inspect it and make the necessary repairs. A machine, called épincéteuse, has been partially employed for this purpose in France.

The various operatives who have been employed on the wool up to the present stage are the following:—wool-sorters, who separate the wool into different degrees of fineness, to be applied to different purposes; pickers, who remove the rough impurities by hand; winnowers, who tend the winnowing-machine, where the locks of wool are separated and loosened, and the dust removed from them; scribblers, who arrange the wool in a light, thin, fleecy sheet; carders, who separate this sheet into rolls about half an inch thick and two feet and a half in length; piecemers, who join these rolls or cards end to end; slubbers, who elongate the cards into thin continuous slubbings; spinners, who still further elongate the wool and convert it into yarn; warpers, who arrange the yarn in parallel layers, to form the warp; sizers, who coat the warp-thread with a layer of size or paste; weavers, who weave the warp and weft into cloth; scourers, who remove the oil, &c. from the woven cloth; tenterers, who hang the cloth on the tenter-frame; and burlers, who examine the dried cloth and repair defects.

[To be continued.]



[The Slubbing-Billy.]

THE BILL OF RIGHTS.

When King James II. found all his attempts to establish arbitrary power were met by a spirit of resistance on the part of the people which it was impossible to subdue, he withdrew privately from the kingdom, and the remainder of his life, which terminated in 1701, was spent as a pensioner of the king of France. The nation being left without a head, William of Nassau, Prince of Orange, who had been invited by some of the most eminent men in the country to assist the people in maintaining their liberties, took the necessary steps to provide for the regular transaction of public business, and his next care was to consult the nation as to the manner in which the government should be re-composed. As no parliament could be called except by James, who, though in exile, was still king, the prince issued circular letters requiring the several counties and boroughs throughout England to send their representatives to a convention of the estates of the realm. It met on the 22nd of January, 1689, and, after some debate, declared the throne vacant, on the ground of James having violated the fundamental laws of the kingdom. Various views were entertained as to the manner in which James should be excluded from the throne, a large party being averse to making a total change in the succession. But the more manly opinion prevailed that James having by his misconduct left the throne vacant, the free right of choosing a sovereign on this occasion reverted to the nation; and on the 13th of February the two houses offered the crown, in the name of the people of England, to the Prince and Princess of Orange (the latter a daughter of the abdicated king), the survivor of them, and their descendants, giving at the same time the entire powers of royalty to the Prince alone. This completed what is justly called the Glorious Revolution of 1688, which established the rights of the people on a firm and broad basis. It was wisely determined not again to give away the crown, as had been done at the Restoration, without taking security for the observance of the laws, which the Stuart family was expelled for violating. With this view, the Convention drew up a Declaration of Rights, in which the principal abuses introduced or sanctioned by the two last kings were shortly recited, and one by one declared to be illegal.

This Declaration was presented to the prince on the 18th of February, immediately before the crown was offered to him; and it was afterwards passed as an act of parliament by king, lords, and commons, and in that shape it is called the Bill of Rights, and is venerated as one of the main bulwarks and charters of our liberties. The principal things asserted in this Act were:—That the king has no power of suspending or dispensing with the execution of existing laws, of imposing taxes, or in any way levying money without the consent of parliament; that it is the right of all subjects to petition the king, without being exposed to punishment for any fancied abuse of that right; that the maintaining a standing army in the time of peace, without consent of parliament, is illegal; that the election of members of parliament ought to be free, and that words spoken in parliament

ought not to be censured or brought into question anywhere out of parliament; and that parliaments should be held frequently. And it concludes—That the Convention do claim, demand, and insist, on behalf of the people, on all these things as their undoubted rights and liberties.

[Landing of William III. at Torbay.—From a picture by Stothard.]

THE DESERTS BORDERING ON PALESTINE,* AND THEIR INHABITANTS.

(From the 'Pictorial History of Palestine.')

To form an idea of these deserts, the reader must imagine a glowing and unclouded sky, over plains so vast that the view is lost in them; and entirely destitute of buildings, trees, rivulets, or hills. Often in these plains the eye meets nothing but an extensive and uniform horizon like the sea; while a few isolated palm-trees, here and there, complete the illusion by appearing in the distance like the masts of ships. In other parts the undulated surface suggests the idea of a stormy sea, while in others it is roughened by rocks and stones. Almost always arid, the land offers only some wild plants, thinly scattered, and thickets, whose solitude is rarely disturbed but by gazelles, hyænas, hares, jerboas, and locusts. Such is the character of nearly the whole country, which extends 600 leagues in length and 300 in breadth, stretching from Aleppo to the Arabian Sea, and from Egypt to the Persian Gulf.

In such an extent of country there is, however, considerable variation of soil. Upon the frontiers of Syria, for example, which is that portion of this immense desert with which we have most concern, the soil is in general rich, cultivable, and fertile. It is of the same character on the banks of the Euphrates; but in the internal parts of the country, and towards the south, it becomes white and chalky, as in the parallel of Damascus, then stony as we advance into the deserts of El Tyh and of the Hedjaz, and ultimately pure sand, as to the east of Yemen. These variations produce corresponding differences in the condition of the inhabiting tribes. In the districts where the herbage is scarce or meagre, as in the Nedjed and in the interior of the great desert, the tribes are feeble and very distant. They become less rare and nearer to one another in those parts where the soil is less bare and the oases more frequent, as between Damascus and the Euphrates, and in the cultivable cantons of the Aleppo pashalic, in the Haouran; and in the country of Gaza the Arab camps are numerous and contiguous. In the first case, the Bedouins are a purely pastoral people, living on the produce of their flocks and on a few dates; in the second, they are demi-cultivators, and sow some land, which enables them to add to their fare a little rice and barley.

This invincible sterility of the desert, even where the soil is naturally fertile, or where not absolutely sandy, is entirely owing to the absence of water; and this want of water is occasioned by the nature of the country, which, being flat and destitute of mountains which might arrest the clouds, they glide over its heated surface during nine months of the twelve without affording a single drop of rain. Thus, during the day, the sky sparkles in brilliance, and is of the finest azure during the night. In winter only, when the cold of the atmosphere condenses the clouds, they soon resolve themselves in showers; but in the interior of the desert the water thus supplied is very quickly absorbed by the arid sands. Upon the borders only it affords an irrigation by which the natural fecundity of the soil is awakened. The summer comes; and all this water disappears without any durable result in springs or perennial brooks. Hence to avoid the inconvenience of wanting water the whole summer, it has been necessary to form, by manual labour, wells, cisterns, and reservoirs, in which to preserve a supply of rain-water for the year. Such works, though rude and inadequate, are expensive and laborious, and are therefore of rare occurrence, except in the more settled districts. Besides, war may destroy in one day the labour of many months, and the resources of the year. A drought, which is but too common, may cause the failure of a crop, and reduce the inhabitants to a total want of water. It is true that, by digging, water may almost everywhere be found at from six to twenty feet deep, but this is gene-

* Although there are not, properly speaking, any deserts in Palestine itself, the deserts by which it is bounded on the east and on the south figure so largely in the history of the country, and exercised so manifest an influence on the condition and relations of its inhabitants, as well as on their ideas and sentiments, that it is desirable to be acquainted with their nature and peculiarities, to comprehend the effects produced.

rally brackish, and the supply is soon exhausted. Then thirst and famine supervene; and unless the government interferes, the villages are deserted. From this it results that the condition of agriculture is, in such border districts, most precarious, and the establishments are constantly menaced with ruin; and when to this operation of natural causes is added the weight with which the exactions of the government press upon the cultivator, it must often seem the better choice to lead a wandering life than to reside in a fixed habitation and rely on agriculture for subsistence.

In those districts where the soil is stony and sandy, as in the deserts between Palestine and Sinai, in which the hosts of Israel spent forty years, and in those of the Hedjaz and the Nedjed, these winter rains make the seeds of the wild plants shoot, and revive the thickets, the ranunculuses, the wormwood, the kali, and the numerous other plants and herbs with which the desert then abounds. They render the lower grounds marshy, which then produce reeds and grass, and the plain assumes a tolerable degree of verdure.

Major Skinner, who crossed at this season the desert between Damascus and Babylonia, describes it as having then nothing appalling but the name,—as being, in fact, a perfect garden, in which it is easy for the traveller to mark his progress by the plants he meets, as every day exhibits the predominance of some new race.

But all this glory of the desert, which supplies so many metaphors to the prophetic writers, is most transitory. On the return of the heats, everything is parched up, and the earth, converted into a gray and fine dust, presents nothing but dry stems, as hard as wood, on which no animals can feed.

Yet even the desert is not without such immunities and congenial charms as endear it to its wild inhabitants, as much as the most fertile and pleasant country can be endeared to a civilised people. Its climate is more fixed and salubrious than that of the countries by which it is bordered. The plague is scarcely known; ophthalmia is very rare; and the small-pox may be described as the only endemic malady. The Arab tribes have, from remote times, divided these wide and arid sands among themselves. These territorial divisions are necessarily of very great extent, as it often happens that the desert in an extent of thirty miles offers only a few roods of land where the flocks can find even a dry and scanty herbage. Thus, in order to obtain nourishment for a few cattle, the Arabs are obliged to overrun vast tracts, and this has engaged them to the nomade life. But besides this physical reason, which explains and justifies the Bedouin condition of existence, there are others of a political sort which are not less operative. For if, in fact, their migratory habits only proceeded from the nakedness of their country, they could advance into the fertile districts along their frontiers, and form there nearly permanent encampments, as the Hebrew patriarchs did in Palestine, ending by founding villages, like the Turkmanns and Koords. But they do not this. They choose rather to dwell in plains the most naked, in steppes the most inaccessible. And why? It is because that which the Arab values before all other things is his independence, his complete isolation from every form of superiority or patronage, whether mild or onerous, cruel or clement. That which the Bedouins most seek is to keep themselves from a position which might lead or compel them to bear arms for the pashas, and leave them at liberty to pursue what they consider their proper trade of rapine and theft. This is the great motive to them of preserving a mode of life which renders such continual and fatiguing removals necessary. But if they chance to light upon a place where they think they can enjoy security and freedom, joined to adequate resources, they remain there, and insensibly pass into the condition of settled cultivators. But if it happens, on the contrary, that the vexatious tyranny of a governor puts an end to the patience of an established village, it is no unusual thing for the inhabitants to flee in a body to the mountains, or into the plains, often changing their stations that they may not be surprised. Sometimes it happens that such people, after having become robbers from the necessities of their position, form new hordes, and ultimately class themselves into tribes. But these new people, born in a cultivable country, almost never quit the frontiers, and never without great difficulty arrive at the determination to throw themselves into the heart of the desert. The desert is the exclusive domain of the Arab who is born in it.

We have not been able to withhold these facts, as they appear to us to contribute much illustration to many circumstances which the sacred history records, and to the conditions and mutations of life which it exhibits. We thus see by what process the migratory inhabitants of the desert become, like the Hebrews, a settled agricultural people; and again, how the people settled on the borders may melt away into the great Bedouin mass. The tendency of such people to remain as near as possible to their original seats would be a most interesting circumstance if it should authorise us to conclude, or even to conjecture, that the descendants of Lot and Esau may still be found among the Bedouins, who are now almost the sole inhabitants of the lands of Moab, Ammon, and Edom.

THE LYRE, THE LUTE, AND THE GUITAR.
No. I.

Stringed musical instruments, partaking more or less of the nature of the harp and the guitar, have been in use from the very earliest times. In the Old Testament there are repeated allusions to them; and the monuments of antiquity brought to light by modern research show numerous specimens of such instruments. They may be divided into two classes, viz. those of which the strings are struck by the finger, as in the harp; and those which are not only so played, but are provided with a neck or finger-board, on which the fingers of the left hand press the strings so as to produce different tones. In the present paper we will speak of instruments of the former class; and, in a second, of those of the latter.

The Egyptians, Greeks, and other early nations, had numerous theories concerning the invention of the lyre, which was probably the earliest instrument of the harp kind; but these theories, as generally happens in such cases, very much contradict one another, and we may therefore dispense with a notice of them here. Particular mention is made, in the Bible, of Jubal, a maker of stringed instruments: different opinions have been expressed as to the form of these instruments; but it is believed that the Hebrew lyre, which was for a long period used at feasts and rejoicings, consisted of ten strings, which were sounded not by the finger, but by a plectrum or quill.

The form of the lyre is represented to have been very varied: provided there were means of fastening the two ends of every string, the wood-work or support might be made to assume any convenient form. Various names were given to the lyre, such as *cithara*, *lyra*, *chelys*, *testudo*, &c., and many attempts have been made to determine what were the distinguishing characteristics of each sort; but the line of demarcation between them certainly cannot be now discovered, for it was optional to put as many strings to the lyre as the maker pleased. The testudo, from its name and its shape, has been supposed to have given rise to instruments of the lyre kind: the idea of Apollodorus was this:—"The Nile, after having overflowed the whole country of Egypt, when it returned within its natural bounds left on the shore a great number of dead animals of various kinds, and, among the rest, a tortoise, the flesh of which being dried and wasted by the sun, nothing was left within the shell but nerves and

cartilages, and these, being braced by desiccation, were rendered sonorous:" this shell, being kicked against by a passer-by, emitted musical sounds from the stretched cartilages, and gave the first idea of constructing a lyre. This is the theory; but it is obvious that a fertile imagination might soon conjure up other theories fully equal to this.

It has been observed that the lyre serves in some respects as a history of the manners of nations: David danced, and played on the psaltery, or Hebrew lyre, before the Ark: Themistocles blushed, at a banquet, at being forced to betray his inability to play on the lyre, a proof of unusual ignorance in a high personage: Nero was an excellent lyrist, and used to play in public. As to what period the lyre came into disuse in different countries, it would be hazardous to offer an opinion derived from any ancient pictures, for artists frequently take great liberties in these respects: an instance of this is given by Dr. Burney:—"In the reign of George II., a marble statue was erected to Handel in Vauxhall Gardens. The musician is represented playing on a lyre. Now if this statue should be preserved from the ravages of time and accident twelve or fourteen hundred years, the antiquaries will naturally conclude that the instrument upon which Handel acquired his reputation was the lyre, though we are at present certain that he never played on a lyre, nor even saw one, except in wood or stone."

In all the instruments to which the above details relate, it is a matter of doubt what was the relation between the strings as to harmony; whether they were attuned to certain chords, and whether those chords resembled those at present acknowledged by musicians. In most representations of the lyre, the strings are nearly of equal length; and therefore unless they were of unequal thickness, or unequally stretched, they would all yield similar tones. This appears to be the most marked point of distinction between the lyre and the harp. In all varieties of the latter instrument, the strings gradually increase in length from one edge of the instrument to the other, in order that, by using strings of different thicknesses, the thicker for the longest strings, a great range of tones may be produced without stretching any of the strings to an extent which they are not able to bear.

When Bruce was in Thebes, he saw, in a cavern or grotto, a picture in fresco of a man playing on a harp: comparing the harp to the height of the player, he guessed the former to have been about six feet high. It is well known that soon after the publication of Bruce's narrative of his travels, it became a sort of fashion to heap ridicule and discredit on all the remarkable passages in the book: the harp did not escape these attacks; for it gave rise to a remark by Lord North, which was intended to have more than one meaning, viz. "that it was not a harp, it was a lyre." We believe, however, that this, as well as other parts of Bruce's narrative, has received subsequent confirmation.

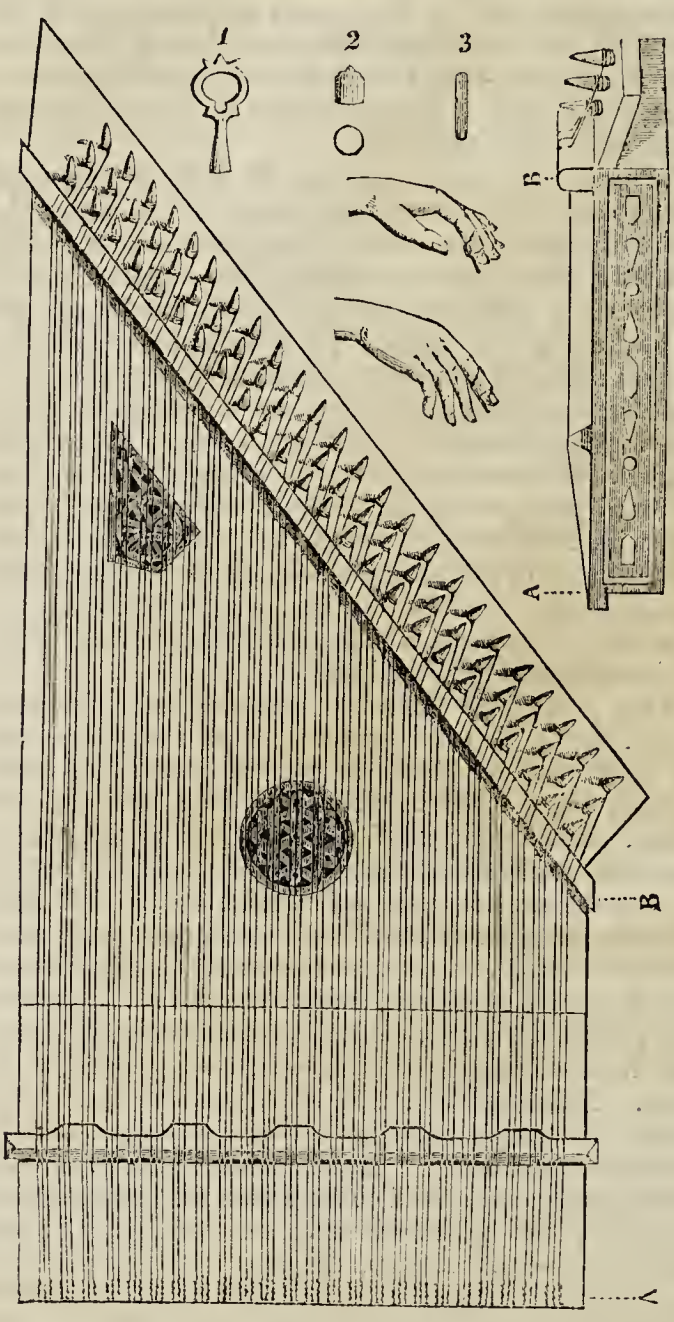
The steps by which the harp has descended to later days, and the successive deviations from the lyre-form to that of the harp, we need not dwell on here. How or when they were brought to Britain we do not know; but in Wales and Ireland the harp is connected with legends extending back to a remote period. In the time of the Welsh princes, an hereditary harp was preserved with care in the household of every prince or lord, to be handed down successively from one baron to another. It seems probable that there were single, double, and triple harps, of the latter of which Mr. Jones says:—"It has three rows of strings: the outside rows are unisons; the middle row the flats and sharps. Its compass extends to five octaves." This means that there were two parallel rows of strings, one for the right hand and one for the left, the corresponding strings being tuned exactly alike; and between these two rows was a third, the strings of which are tuned to the semitones of the outer rows. The Irish had harps of different kinds, probably to perform music of different styles: one was something like the Welsh harp; a second was a species of dulcimer; and a third was a kind of guitar, with ten strings. The Anglo-Saxons appear also to have been acquainted with the harp; for our chroniclers relate the story of Alfred the Great reconnoitring the Danish camp in the disguise of a harper. A similar device was played by Anlaff and other Danish chiefs upon Athelstan.

The great distinction between all ancient harps and those in use at the present day consists in the pedals, by which the power of modulation of the instrument is greatly increased. The frame-work of the harp consists principally of three parts, arranged in the form of a triangle. One of these is an upright pillar or support; another branches obliquely downward from the top of the pillar in a serpentine form, and is provided with pegs, to which the strings are attached; the third is a long hollow kind of barrel. The sounding-board is a portion of this last-mentioned piece, and is generally made of fir, and provided with little studs, to which the strings are attached. The upper end of each string is attached to a peg, capable of being moved round in a socket by means of a key, and this motion tightens or slackens the string, whereby the tone is rendered higher or lower.

In the piano-forte there is a separate note, or separate key and string, for every semitone, so that the player can play in every key. This is not the case in the harp; for, from the manner in which it is held, and for other reasons, such a number of strings would be unmanageable; and nearly all the improvements of which the harp has been the subject have had relation to the production of a great number of tones from a comparatively small number of strings. A common form of the harp in early times was that of thirty strings, tuned to the diatonic scale, so that the player could only play in one key, there being none of those semitones which we call flats and sharps. Additions were made from time to time to the number of strings, but this left the evil of a want of semitones unremedied. Luc-Antoine Eustache, a Neapolitan gentleman, is said to have been the first to remove this defect; but his means were too complex: he provided seventy-eight strings, disposed in three ranks, one containing the diatonic scale, a second containing octaves to the former, and a third containing semitones. The difficulties of playing this instrument were found to be more than a match for the increased power obtained, and it was abandoned. An attempt was next made to combine two rows of strings in such a manner as to produce the desired result; but it does not appear that this attempt was successful. About the end of the seventeenth century, a contrivance was attached to the harp by which the tone of any particular string could be raised half a note; but this contrivance had to be worked by the hand of the player, so that whenever he had an accidental flat or sharp in the course of a piece of music, he had only one hand at liberty to play the instrument.

It was (according to M. Béchem) Hochbrucker who, in the early part of the last century, invented the mechanism of *pedals*, by which the pitch of certain strings could be raised a semitone. The mechanism was carried up from the pedals to the pegs at the top of the harp; and the upright column, which had hitherto been made solid, was now made hollow in order to admit the connecting mechanism. This mechanism was afterwards improved by other persons, and the harp ultimately became an instrument having seven pedals. The operation of these pedals was this:—each one was devoted to a particular note in the gamut or octave: by pressing down a pedal, some levers and other connecting mechanism raised by half a tone the pitch of the note connected with that pedal, throughout all the octaves; and as any one or all of the pedals could be pressed down at once, the strings, which were at most forty-three in number, were

capable of producing all the semitones in six octaves, a result which cannot be effected on the piano-forte with less than sixty-seven keys. These strings were attuned to the diatonic scale, or scale of whole tones, and the semitones were produced by the pedals.



[The Ckánoón.]

No 1 is the key; 2, the ring or thimble; 3, the plectrum. A and B, in the small figure, show the mode of fixing the strings in A and B of the larger one.

But the greatest improver of the harp was Erard, an elder member of a distinguished London firm. Such a harp as we have just spoken of is called a *single-action* harp, because each pedal is capable of producing one single change. An extension of this is the *double-action*, produced by very beautiful mechanism: this is of such an effect, that one pedal can give to a string three different tones, sharp, flat, and natural, separated from each other by semitones. For instance, if a string, in the natural position of the pedal attached to it, produced C ♭, a moderate pressure on the pedal will raise it to C ♮, and a further change of position raises it to C ♯. By means of seven pedals, all possessing this double power, and devoted respectively to the seven notes of the octave, every string is subject to the foot of the performer to the extent of three different tones; so that in whatever key a piece of music may be written, the harp may be made capable of grappling with it. This, however, does not get rid of a defect which is not seen in the piano-forte: a chromatic passage, that is, a rapid succession of semitones, cannot with ease be played on the harp, because there are not, as in the piano-forte, strings to every semitone: the difficulties of playing are very great to the harpist. We do not propose to enter into the minutiæ of construction, and shall therefore refrain from dwelling on various modern improvements on the harp, having relation more or less to the action of the pedals.

There have been two forms of musical instruments which, so far as we have now the means of judging, seem to have resembled each other, viz. the *psaltery* and the *dulcimer*. We notice them here, because they may be deemed a kind of harp held horizontally. The dulcimer was described by Dr. Burney as an instrument of a triangular form, strung with about fifty wire strings resting on a bridge at each end, the shortest wire being about eighteen inches in length, and the longest about thirty-six. The instrument is laid out flat before the performer, and he plays on it by striking the strings with two small rods, sticks, or hammers, one held in each hand, the force of the stroke being varied according as the tones are required to be *piano* or *forte*. The *psaltery* appears to have been of a smaller size, of a four-sided figure, and to have been provided with much fewer strings than the dulcimer.

A kind of dulcimer forms a favourite instrument in Egypt at the present day. It is of a four-sided figure, with three rectangular and one sloping side. A specimen of this instrument which Mr. Lane examined, and which is called a *ckánoón*, was about forty inches long, sixteen inches wide, and two inches deep. The face and back were made of fine deal, and the sides of beech. The sloping side of the instrument, which is made of beech, is provided with seventy-two pegs, round which are wound the ends of the same number of strings, the other ends of the strings being fastened to the other end of the instrument. The strings pass over a bridge; and in order to aid the resonance, the face of the instrument is pierced in two places. The strings are made of lamb's gut, and are arranged in triplets, each note having three strings tuned in unison; but we are not aware whether the intervals between adjoining triplets are semitones or whole tones. The fore finger of each hand is armed with a plectrum made of a thin piece of buffalo's horn, kept close to the finger by a sort of thimble or sheath; and with these plectra the strings are touched. The player sits down, in the attitude customary among Oriental nations, and places the instrument on his knees.

In different parts of the world, instruments are in use bearing more or less a relation to those which we have described; but their nature will be sufficiently appreciated by bearing in mind that the strings are of nearly equal length, as in the lyre; or of different lengths, as in the harp; or that the whole are laid horizontally, as in the dulcimer; but that none of them have a finger-board, as in the lute and guitar.

[A Player on the Ckánoón.]

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THE POKROVSKI CATHEDRAL, MOSCOW.

[Cathedral of the Virgin Mary, or St. Basil, at Moscow.]

Among the many objects of interest that meet the eye of a stranger in almost every part of Moscow, there are few that arrest his attention more strongly than the Pokrovski Cathedral, with its numerous and brilliantly coloured domes and steeples, standing on the south side of the 'Beautiful Place,' a square in every way worthy of its name, for it is one of the largest and finest in Europe. This edifice has been known even in Russia by different appellations, a circumstance that makes it difficult, occasionally, to know when writers are or are not alluding to it: thus Clarke in his 'Travels' calls it the church of St. Basil, a name by which it is now frequently known; but, according to Mr. Lyall,* the proper designation of the edifice is that we have placed at the head of this article. It is dedicated to the Virgin Mary, and the word *Pokrove* signifies that it is under her protection. The edifice was built by the Czar Ivann Vasilievitch to commemorate his gratitude for a victory obtained over the khan of Kazan in 1554. The exterior was painted by his son and successor, Phedor Ivannovitch, towards the close of the same century. Two inscriptions on the cathedral record these events, and state that the founder raised in addition nine churches on the same foundation, and that his son built eight more. During the reign of the empress Catherine, in 1774, the interior and exterior were repainted at an expense of ten thousand roubles, which had been given for that purpose. Injured by time, and still more by the French during the invasion of 1812, a complete external reparation took place in 1816-17, when the balls and crosses of the steeples were also regilt.

* 'Character of the Russians.'

The foundation of the cathedral forms an oblong square; from the centre of the pile rises a lofty octagonal spire, surmounted by a small dome, and a gilt ball and cross. From the latter hang slender chains extending over the dome below, an ornamental feature exceedingly prevalent in Russian architecture. Around this central steeple rise eight others, forming a species of octagon, the whole decorated, like the first, with domes, balls, crosses, and chains, but smaller in size, with the exception of the domes, which are much larger. The domes are painted in the brightest and most varicgated colours, and all differing from each other; some covered as with a net-work of green upon a ground of yellow, another is of a dazzling red, with broad white stripes; whilst others, again, are gilded; and as it has been a fashion among pious individuals to leave sums of money to defray the necessary expenses of repainting for ever, they are not likely to be soon shorn of their glories. At the north-east corner is a large low dome, which in some measure impairs the general effect of the structure; fortunately it rather evades than obtrudes itself upon the spectator's eye. At the east corner stands detached a small belfry or steeple of a pyramidal shape. The principal entrances to the upper story are on the north and on the south, by covered stairs, over which are built small green tiled spires. Before the French invasion the Pokrovski Cathedral was surrounded by a row of petty little shops, principally occupied by the dealers in ecclesiastical books and in wax candles, the latter a commodity in great request at all the sacred festivals. The shops are now removed (the dealers being accommodated in the ground story of the cathedral), and a

high and handsome wall of polished sandstone with iron balustrades erected in their room.

The interior consists of two stories, of which the uppermost is formed by the bases of the different steeples. We have already stated that the church was founded by the Czar Ivann Vasilievitch and his son for seventeen churches; there are now in all twenty-one. Of these eleven are on the ground story, and ten on the upper, the lower part of each steeple forming a distinct church or chapel. It will be seen from this statement that the fact of there being twenty-one churches congregated together in one building is not so very wonderful as we might at first imagine; they being all very diminutive: the largest of them, which is that called peculiarly the Cathedral Church, and which occupies the interior of the central steeple, is ludicrously small when compared with the ideas attached by ourselves to edifices of that rank. Light is admitted into the churches of the upper story through long narrow windows in the spires, and through windows opening into a gallery which runs round the lower part of each spire. We may add to this account of the edifice, that the founder, according to Olearius, was so pleased with the building as to exhibit his gratitude to the architect in a very extraordinary way:—it is said he ordered his eyes to be put out, in order to prevent his constructing any other and superior work to eclipse the splendour of this: a tale unsupported by any evidence, and therefore unworthy of the slightest credence.

There are two great festivals solemnised in this cathedral; on the 2nd of August, and on the 1st of October, when processions take place, and a variety of ceremonies are observed. The first is in honour of the "Holy Vasilii, miracle-worker of Moscow, who for Christ's sake became insane," and who died on this day, 1552. From his earliest years it appears that Vasilii acted in an insane manner, running about the streets wildly, and neglecting alike food and clothing. He was looked on accordingly as an inspired being, crowds flocked about him, desirous of his counsel, and when he died the metropolitan Makarii presided at his funeral. A silver coffin was afterwards made to enclose his remains, which was gilded, adorned with precious stones and pearls, and over this and the tomb on which it stood was erected the most beautiful of the eleven churches we have mentioned of the lower story, since known by his name. On the day of the feast, the entire edifice is thrown open to the public. A large and singular representation of the saint is exhibited before the entrance to his church, and close by is an iron box; the first destined to receive the reverent acknowledgments of the people, and the last their money, at least such portion of it as they are inclined to spare. The relics are exhibited amidst still greater marks of veneration, most of the spectators bringing a small wax candle to set up round the tomb and before the numerous images of the saint placed in different parts of the church. The other festival is in honour of the Virgin Mary, and is marked by similar proceedings, only that the chief place is now the Cathedral Church in the central spire. There was a third festival observed in former times, on Palm Sunday, and which was discontinued when Peter the Great abolished the Patriarchate in 1721. This is described by Olearius as follows: "1636, April 10th, being Palm Sunday, the Muscovites had a noble procession to represent our Saviour's entry into Jerusalem. The great duke, having been at service at Our Lady's Church, came out of the castle with the patriarch in very good order. First came a very large chariot, made of boards nailed together, but low, drawing after it a tree, on which hung abundance of apples, figs, and grapes. In it were four little boys with surplices, who sung the hosannas. Then followed many priests in their surplices and crosses, carrying crosses, banners, and images upon long poles; some of them sung, others cast incense among the people. Next came the goses, or duke's merchants; after them the deacon, clerks, secretaries, and having most of them palms in their hands, and went immediately before the great duke, who was most richly clad, with a crown upon his head, supported by the two principal counsellors of state, Knez Juan Borisotwit Cyreaski, and Knez Alexey Michailovitch, who himself led by the bridle the patriarch's horse, which was covered with cloth, and made to represent an ape. The patriarch who rid on him had on his head a round white satin cap beset with rich pearls, and about it a very rich crown. He had in his right hand a cross of diamonds wherewith he blessed the people, who received his benedictions with great submission, bowing their heads, and incessantly making the sign of the cross. About and behind him were metropolitans, bishops, and other priests, whereof some carried books, others censers. About fifty little boys, most clad in red, put off their cassacks,* and scattered them along the way: others had pieces of cloth about an ell square, of all colours, which they laid on the ground for the great duke and patriarch to pass over. The duke next went into the church, where he stayed about half an hour. The honour the great duke did the patriarch in leading his horse is worth to him four hundred crowns, which the patriarch is obliged to pay him. Upon Palm Sunday the same ceremonies are observed all over Moscovy, the metropolitans and bishops representing the person of the patriarch, and the weiwodes, or governors, that of the great duke."†

THE LYRE, THE LUTE, AND THE GUITAR.

No. II.

[Continued from No. 546.]

In our last paper on this subject, we attempted to give a general idea of those stringed instruments the mode of playing which somewhat resembles that of the harp. We have still to consider those which have a neck or finger-board.

The object of a finger-board is to enable the performer to produce a large number of tones with a small number of strings. Suppose a string two feet long were stretched so as to produce one of the notes c: if the finger be placed on the middle of the string, either half will yield a c an octave higher than the former; if the finger be placed at the distance of eight inches, or one-third the length, from one end, the longer section will yield the note f, a fifth higher than the original; and by placing the finger at other divisions or points, all the notes of one, two, or three octaves may be produced in succession from one string. In order to effect this, the string is placed near the surface of a board, so that the finger may press the string down close to the board. This then is what we mean by a finger-board.

Now much discussion has arisen as to whether any instruments with finger-boards were known to the ancients. Montfaucon says that of six hundred representations of lyres and similar instruments, which he had seen in ancient sculptures, and which he had examined, he did not find one with a finger-board; but all had open strings such as the harp and lyre are provided with. More recent research has shown reason to believe that instruments with finger-boards were not altogether unknown in early times; but there is not sufficient certainty to induce us to go back farther than the instrument called the lute.

The lute has been mentioned more or less by writers since the time of Boccaccio, about five centuries ago. Chaucer, Shakspere, and other writers, both here and abroad, make occasional mention of the lute; and in

* Cassacs—kushâks, girdles or cinctures made of leather, worsted, or silk, to bind the wide flowing coats of the Russians round the waist.

† Olearius's 'Travels of the Ambassadors sent by the Duke of Holstein to the Great Duke of Moscow,' Davies' translation, fol 1662, p. 40.

Whitelock's narrative of a masque given to Charles I. and his queen in 1633, by the members of the inns of court, it is said that there were "forty lutes," besides other "instruments and voyces of the most excellent kind in consorte." The taste for the lute appears to have been at its height in England in the sixteenth and the early part of the seventeenth centuries; but after that to have declined. There is a curious work, published by Thomas Mace in 1676, called 'Musick's Monument.' Mace was a lutenist, and an enthusiastic lover of the instrument: the book is chiefly a practical treatise on the lute: he was an old man when he wrote it, and he begins with an address to his lute, which affords good evidence that the instrument was at that time getting into disuse.

Author.—"What makes thee sit so sad, my noble friend,
As if thou wert, with sorrows, near thy end?
What is the cause, my dear renowned lute,
Thou art of late so silent, and so mute?
Thou seldom dost in public now appear;
Thou art too melancholy grown, I fear.

Lute.—What need you ask these questions why 'tis so?
Since 'tis too obvious for all men to know.
The world is grown so slight, full of new fangles,
And takes their chief delight in jingle-jangles;
With fiddle-noises, pipes of Bartholomew,
Like those which country wives buy, gay and new,
To please their little children when they cry:
This makes me sit and sigh thus mournfully."

The author and the lute proceed to discourse on the depraved taste of the times, by which lutes became out of fashion; but we must leave them to settle it.

The lute consisted of four parts, the table, the body, the finger-board, and the head. The table was a flat broad surface, generally of somewhat oval shape, with a circular perforation in the middle to aid the emission of sound. The body was a curved or polygonal surface, which, being joined at the edges to the table, formed a hollow cavity for the resonance of the sounds produced. The finger-board was a long kind of neck, sufficiently narrow to be grasped by the hand, and provided with little ridges or frets, so arranged that by pressing down the strings on these frets, the effective lengths of the strings were adjusted so as exactly to produce the regular tones and semitones. The head was the end of the instrument, and provided with screws or pegs, to which one end of each string was attached. There was also a bridge, to keep the strings clear of the table or surface of the instrument.

As to the number of strings employed, we may use Mace's own words:—"In former times they had to their lutes but few strings, viz., to some ten, some twelve, and some fourteen strings, which in the beginning were almost altogether in use. But soon after they began to add more strings, which they finding to be so great a convenience, stayed not long till they added more, to the number of twenty-four, where we now rest satisfied. And here you must take notice that when we say a lute of twelve strings, there are but six; and likewise a lute of twenty-four strings, there are but twelve (as to substantial use); for we always tune and strike two strings together as one; so that in the old time, upon their lutes of twelve strings, as to use they had but six." This clearly explains the mode of stringing the instrument. For the convenience of tuning, the lute had often two heads, one containing the pegs or screws for the higher strings, and the other those for the bass.

The distinction between the *theorbo* and the *lute* does not seem to have been clearly laid down; but there is reason to believe that the lute was a smaller instrument, consisting of six double strings; while the theorbo, in addition to those, had some very long strings to produce the bass notes.

The difference between a lute and a guitar appears to have been, that in the latter there is only one string tuned to a particular pitch, while in the former they were tuned in pairs; also that the number of strings in the guitar is six, while those in the lute often amounted to twenty-four. These two circumstances may probably serve to account for the superseding of the lute by the guitar; for the former is said to have required a wearying amount of tuning before the player could commence his performance. The modern guitar seems to have been derived by the rest of Europe from the Spaniards, and by the Spaniards from the Moors. It is certain that in Spain and Portugal the use of the guitar has been very extensive. The passion for it extended to Italy and France, but not to so great an extent as in Spain. In England, towards the latter end of the last century, it became so much in fashion as seriously to injure the trade of the spinet and harpsichord makers; and a circumstance is related, by Dr. Burney, of Kirkman, a harpsichord-maker of that period, by which he sought to effect a change in the public taste. The ladies sold their harpsichords or exchanged them for guitars; and Kirkman had his warerooms filled with instruments of his own make, which he had thus procured; and for new ones he had scarcely any sale whatever. He purchased a number of common cheap guitars, and presented them to persons moving in an humble station in life: this is said to have had the effect of soon giving the guitar a vulgar reputation, and of inducing a return to the use of the harpsichord. Whether this be true or not, it is certain that the guitar has been much less in favour than the piano-forte, the immediate successor of the harpsichord.

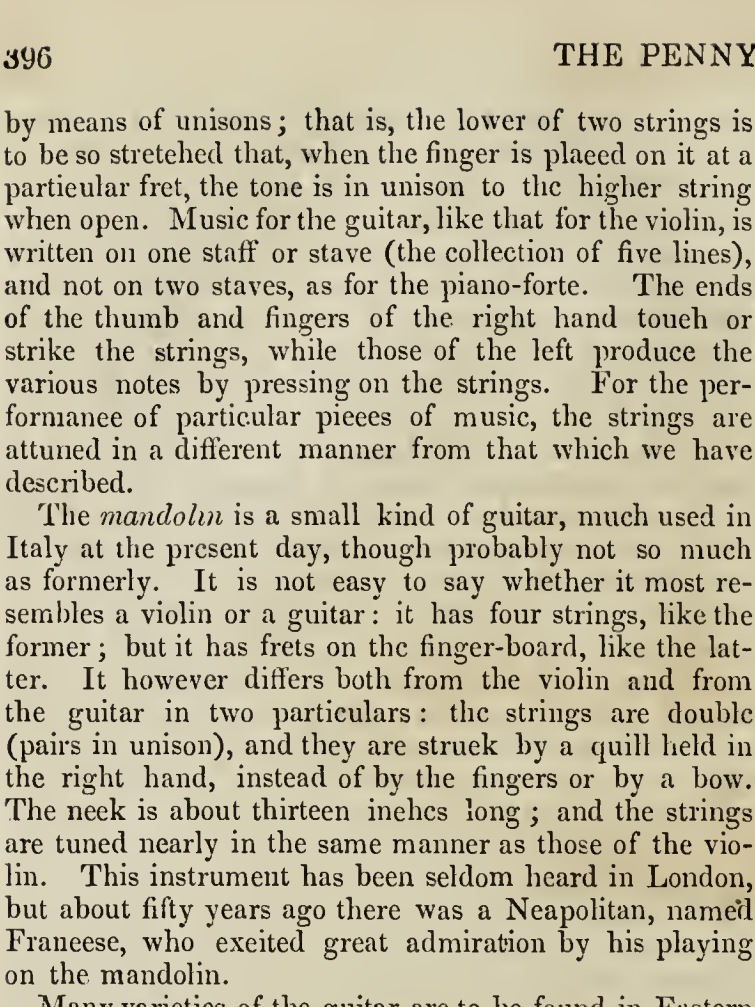
The guitar, which succeeded the lute in England, and which has been called the English guitar, was a sort of medium between the lute and the modern or Spanish guitar. It had six wire strings, four of which were double, that is, pairs in unison, like the lute, and two single, as in the Spanish guitar; there were therefore in fact ten strings, although in point of effect there were but six: some of these strings were of steel, and some of brass; some were covered, and others uncovered.

The Spanish guitar, as at present made, seems to be larger than the majority of similar instruments of which we have made mention. It consists of a body rather elegantly curved, the front and back of which are nearly or quite flat. The back and sides are of satin-wood, maple, or some other wood capable of receiving a polish; and the front or face is made of fir, and unpolished. In some guitars the face is made of the same kind of wood as the other parts of the body, and similarly polished; but this is generally considered to be detrimental to the vibrating power of the instrument. Affixed to one end of the body is the neck or finger-board, provided with a row of frets arranged at proper distances from one another. The neck is so long that the player is enabled to produce a great number of tones from each string. The strings, six in number, are firmly fixed by studs into small holes at one end, and are wound round wooden pegs at the other: these pegs work in sockets, and can be turned so as to stretch the strings in any desired degree. A patented contrivance has been brought into use within a few years, by which the strings can be stretched more readily and with a greater degree of precision than before, while at the same time they are not liable to slip or run back while being tuned. The common mode of tuning the guitar is this:—the highest and lowest strings are each tuned to E, two octaves asunder; and the other four are, beginning from the lowest, A, D, G, and B; therefore the intervals between contiguous strings are all fourths, except that between G and B, which is only a major third. These notes are those yielded by the open strings, when the fingers are not pressed on them: if the strings are pressed so as to touch the several frets on the finger-board, the tones are higher, and the more so as the place of contact is nearer to the body of the guitar. To a player whose ear is not sufficiently correct to determine musical intervals, the frets offer a convenient means of tuning the guitar

by means of unisons; that is, the lower of two strings is to be so stretched that, when the finger is placed on it at a particular fret, the tone is in unison to the higher string when open. Music for the guitar, like that for the violin, is written on one staff or stave (the collection of five lines), and not on two staves, as for the piano-forte. The ends of the thumb and fingers of the right hand touch or strike the strings, while those of the left produce the various notes by pressing on the strings. For the performance of particular pieces of music, the strings are attuned in a different manner from that which we have described.

The *mandolin* is a small kind of guitar, much used in Italy at the present day, though probably not so much as formerly. It is not easy to say whether it most resembles a violin or a guitar: it has four strings, like the former; but it has frets on the finger-board, like the latter. It however differs both from the violin and from the guitar in two particulars: the strings are double (pairs in unison), and they are struck by a quill held in the right hand, instead of by the fingers or by a bow. The neck is about thirteen inches long; and the strings are tuned nearly in the same manner as those of the violin. This instrument has been seldom heard in London, but about fifty years ago there was a Neapolitan, named Francese, who excited great admiration by his playing on the mandolin.

Many varieties of the guitar are to be found in Eastern countries. Mr. Lane speaks of one called the *'oód*, in use at present among the Egyptians. The name is supposed to be derived from the same source as that of the lute. The length is rather more than two feet. The body is plano-convex, that is, flat on the upper face and curved on the lower, and generally made of fine deal with ebony edges. There is a neck similar to that of a guitar, made of ebony and faced with box; and from one end of the instrument to the other are stretched seven double strings, the two forming each pair being tuned in unison. The mode in which the seven pairs



[The 'Oód. 1, Front View; 2, Side View.]

of strings are tuned is very different from that of the guitar. The strings are not struck with the finger, but by a plectrum formed of a slip of vulture's feather. There do not appear to be any frets on this instrument.

[Egyptian Player on the 'Oód.]

A very remarkable kind of a guitar, called a *vina* or *been*, is used in India, and has been described in the 'Asiatic Researches.' It consists of a finger-board longer than usual, with a large gourd attached at each end of the guitar. From end to end are stretched seven strings or wires wound round pegs in the usual way, some of the wires being of steel and the others of brass; and four are on the upper surface, while three are at the sides. There are about twenty frets ranged along the finger-board at certain measured intervals, and some of these frets stand up as much as an inch from the level of the finger-board; these frets are fixed on by means of wax, and the performer regulates the positions of them at his own pleasure. It does not clearly appear what are the uses of the two gourds, which are as much as fourteen inches in diameter; but they seem to serve as supports, for the instrument is held in an inclined position across the body, one gourd resting on the left shoulder, and the other on the right hip. If these gourds were hollow, we might hazard a conjecture that they served in some degree the purpose of "sounding-boards" to aid resonance. The strings are pressed or stopped with the fingers of the left hand, while those of the right strike the strings. The tones from this instrument are said to be generally pleasing.

The inhabitants of Congo are said to have a singular kind of lute or guitar, of which the body is made principally of parchment. It is strung with the hair of an elephant's tail, the strongest and best that can be chosen. The strings are stretched from one end of the instrument to the other, and are fastened to rings fixed at different places. To these rings are suspended small plates of iron and silver, of different sizes and different tones. When the strings are played upon, these little metal plates are set in motion, and produce a jingling sort of noise which is appreciated as a sort of accompaniment to the sounds properly belonging to the strings.

Money struck by Cardinal Wolsey.—In the year 1529, among other articles exhibited against Cardinal Wolsey, was one charging him with having "enterprised to join and imprint the cardinal's hat" upon his "coin of groats." Ruding considers that the fault here laid to the cardinal's charge was not merely the placing the hat upon his money, but the striking of coins of a larger denomination and value than the penny, "he being the only prelate who struck groats and half-groats;" but this conjecture is groundless, as there are half-groats of the other prelates with their initials. It was clearly the *hat* which gave the offence.—*Akerman's Numismatic Manual.*

CHERTSEY, SURREY.

[View of Chertsey, from the North.]

About one hundred and seventy years ago, the poet Cowley, inviting one of his friends to visit him at his house at Chertsey, writes, "You may very conveniently come hither by way of Hampton Court (thirteen miles from London) —lying there one night:"—such was then the ill-condition of the roads in England, and so imperfect the means of travelling. By the South-western Railroad we may now reach Weybridge, a town within two miles of Chertsey, in something less than an hour, thus effecting a saving to the man of business of a two or three days' journey, and giving the antiquary and lover of rural scenery an opportunity of visiting one of the oldest and prettiest villages near London at the sacrifice of little more than the time occupied by a meal. And this is one of the advantages of railroads, which the lover of the country and of the picturesque should not forget, when he grumbles at the noise and smoke of the engines as they fly past him in his rural walks, that by their means he is enabled with facility to escape from the large manufacturing cities and their almost endless suburbs. It is therefore with a feeling of gratitude towards the enterprising spirit of the age, to which we are indebted for such rapid means of locomotion, that the citizen of London, after an hour's ride, finds himself set down at a beautiful part of the country, so free from the fogs and smoke of the metropolis, that he might imagine himself to be a hundred miles from it.

Chertsey is one of the places he might reach by such a mode of conveyance, and as it is a town of some antiquity, pleasantly situated, not destitute of historical associations, and withal but little known, the following notice of it will perhaps be acceptable to such of our readers who are in the habit of occasionally enjoying a healthy and pleasant holiday in the country.

Chertsey is situated on the banks of the Thames, about twenty miles from London, on the north-east side of the county of Surrey. It consists of one long street running from east to west (half of which is called Bridge Street, the other half Windsor Street), and one running from north to south called Guildford Street, the names having been given to these streets from places to which they lead. In the centre of the principal street on the north side stands the church, and near it the market-house, a handsome and convenient structure erected some time since in place of an old building devoted to this same purpose, which, besides being too small for the increasing population and business of the town, obstructed the view of the church from its too close approach to that building. The present name of the town has been supposed to be a corruption of the term 'Cæsar's Isle,' as it was about this place that Cæsar is conjectured to have crossed the Thames on his second invasion of England. From various old MSS. still in existence, it appears the Saxons named it the *Isle of Cirotis*, which sounds so unlike *Cæsar*, that we may be pardoned for doubting if it were ever indebted to that emperor for the name. Who or what *Cirotis* may have been we know not, but the rest of the name, preserved in the second syllable of its present designation, Chert*seye*, was bestowed on it from its insular position; the Thames and the 'Abbey River' being on one side, and on the other a small stream called the Bourne, which, coming from Virginia Water in Windsor Park, crosses Guildford Street in its way to the Thames, which it reaches just above the junction of that river with the Wey at Weybridge.

Chertsey (although of older date as a hamlet, or small collection of cottages) owes its existence as a town to the establishment of an extensive monastery, which was founded here as early as the year 666, soon after the Saxons were converted from paganism, by Frithwold, a petty prince of Surrey, under Walpher, king of the Mercians.

The monks were of the Benedictine order, and were richly endowed; but on the incursion of the Danes, in the year 1010 or 1011, the abbey was pillaged, the abbot and ninety monks murdered, and the greater part of the building destroyed. It was however soon after rebuilt by Egbert, king of Kent, rapidly regained its former importance, and gradually increasing its revenues, became one of the most magnificent and richly endowed monasteries in the kingdom. Henry VI. was buried here under a sumptuous mausoleum, but the body was removed, on the accession of Henry VII., to Windsor, and afterwards to Westminster Abbey. The monastery was dissolved with the other religious houses, in the reign of Henry VIII., when its annual revenues were 744*l.* 12*s.*, then a considerable sum. Of this ancient and extensive pile of buildings scarce a vestige now remains. There are a few stones forming a wall, and part of an archway still remaining on the north side of the town near the church, and a barn (seen in the view above) has been constructed from a portion of the ruins; but, with these exceptions, we believe no part of the original structure is

now standing. Stukeley, the antiquary, who visited the town in 1752, for the purpose of prosecuting his inquiry respecting Cæsar's passage of the Thames, feelingly laments the total wreck of what was once an object of such grandeur. "I first went with eager steps," says he, "to view the Abbey, or rather the site of the abbey; for so total a dissolution I scarcely ever saw; so inveterate a rage against every the least appearance of it, as if they meant to defeat the inherent sanctity of the ground. Of that noble and splendid pile, which took up four acres of ground and looked like a town, nothing remains; scarcely a little of the outward wall of the precinctus." And afterwards, on going into the gardens of the mansion erected on the site of the Abbey, by Sir Nicholas Carew in the reign of Charles II., and which is still called Abbey House; he remarks, "Human bones of the abbots, monks, and great personages, who were buried in great numbers in the church and cloisters which lay on the south side of the church, were spread thick all over the garden, which takes up the whole church and cloisters; so that one may pick up handfuls of bits of bones at a time everywhere among the garden-stuff." Well may we ponder on the vanity of human wishes, and exclaim, *Sic transit gloria mundi!*

When the Abbey was taken possession of by Henry VIII., the manor of Chertsey became the property of the crown, and has ever since remained under its control, being granted to one of the royal family or let on lease to other persons.

The Abbey house and lands were granted by James I. in 1610 to Dr. Hammond, in whose family they remained till 1673, when they became the property of Sir Nicholas Carew, from whom they passed into the Orby family. Sir Charles Orby sold them to Sir Nicholas Wayte, and from his heirs they were purchased by Mr. Robert Hinde, a wealthy brewer. The next possessor was W. Barwell, Esq., who purchased the house in 1753, the lands having been before disposed of to different persons. In 1809 the property was sold by lots, the principal part being bought by George Holme Sumner, Esq., who pulled down what little remained of the old buildings, and made several improvements in the modern mansion.

Chertsey Church, dedicated to St. Anne, is a modern structure, with the exception of the tower and chancel, having been erected in the year 1806, in consequence of the dilapidated state of the old building. We are not certain when a church, distinct from that appertaining to the Abbey, was first consecrated, but it must have been previous to the year 1330, as in that year Abbot Rutherwych of the monastery endowed a vicarage with house and curtilage adjoining, and gave it to John Storith, then vicar, for the use of himself and successors. The present church is a handsome building erected at the cost of 12,000*l*., and possesses a peal of bells. As late as the year 1814 the curfew bell was still tolled here from Michaelmas to Ladyday at eight o'clock in the evening in the following manner:—The clerk first *rung up* (as he expressed it), that is, raised the bell; he then rung a few minutes, lowered the bell down, and, after a short pause, tolled the number of the day of the month.

Chertsey being situated at a part of the river which was formerly fordable at particular times of the tide, it was not until a late period of its history that it was considered necessary to erect a bridge. A ferry was, however, early established, and still remains about a mile above the present bridge. A modern bridge was erected in the fifteenth century, which remained until the year 1785, when it was superseded by a handsome structure of Portland stone, designed by Payne. It consists of seven arches, and cost 13,000*l*. building, the counties of Surrey and Middlesex sharing the expenses.

In the town are several almshouses, and a free-school, founded in 1725, by Sir William Perkins, for educating and clothing twenty-five boys and as many girls.

In Guildford Street is the house where Cowley the poet lived and died. It obtained the name of 'The Porch House' from a wooden porch which projected considerably into the street to the great inconvenience of the passengers. This was however removed in the year 1786, and an inscription placed on the house, under the window of the room in which Cowley died (in 1667), to record the fact and as a tribute to his memory.

A pretty summer-house which he built, and a seat under a sycamore-tree, both mentioned in his poems, were destroyed previous to the year 1752.

The seats of Woburn, Ongar Hill, and St. Anne's Hill (the last a high hill to the south-east of the town, a spring at the top never dry) are in the neighbourhood.

Near Chertsey also is Coway-Stakes, the spot at which Cæsar is supposed to have crossed the Thames on his invasion of Britain. This point has however been much disputed, London, Kingston, and other places being advocated by different antiquaries. But the authorities in favour of Coway-Stakes preponderate, though Kingston has still its supporters; and much good paper has been wasted in the controversy to which such conflicting opinions have given rise. We hope, however, the antiquaries of the present generation are too wise to waste talents, which might be applied to more valuable purposes, on such trivial questions; for, after all, could the fact be determined as to whether Cæsar crossed the Thames at a mile or two on this or that side of a certain spot, no advantage would accrue to us from the knowledge, either historically or in any other point of view.

CASPAR HAUSER.

This singular individual excited an astonishing degree of interest in the public mind in 1828, and for several years after; indeed, the circumstances connected with his remarkable story are still the subject of much speculation, and probably there are few persons unacquainted with the early accounts given of him, and which received almost universal credit. It was during this period of excitement, and when little had been done to investigate the truth of the story told by Hauser, that a brief account of him was given in 'The Penny Magazine' (vol. iii., Nos. 118, 119, 120). This was abridged from the work of M. von Feuerbach. A knowledge of the circumstances therein detailed is necessary to enable the reader to understand clearly our present object.

Earl Stanhope is known to have taken the greatest interest in the fortunes of Caspar Hauser, and to have become his foster-father: it must therefore have been a painful discovery to that nobleman that he had been lavishing his kindness on an impostor, and, by his countenance, had been contributing to the general delusion. This latter impression induced the Earl to investigate the story in the most minute manner, and to give the result of his inquiries to the public. He obtained the testimonies of those persons who had the earliest opportunities of seeing and observing him after his arrival at Nürnberg. These testimonies had not been received by Von Feuerbach, whose account, so far from being established by official documents, shows that he concealed many important facts, and misrepresented much of the story. The Earl's reasons for disbelieving the story of Hauser are given in a series of letters to persons who had been engaged with him in protecting and instructing his charge, and from these we have collected the observations which we place before the reader.

Years have passed away since the appearance of Caspar Hauser first occasioned so much discussion, and he now sleeps in the silent tomb; but his story will long continue one of the most remarkable on record, and must elicit our surprise that, at an age so early, and so defective as must have been his experience and knowledge, he

was, without apparent preparation, enabled to deceive so many persons of known talent, the most eminent of whom was M. von Feuerbach himself. It is not less remarkable that, neither on the arrival of Caspar Hauser nor during the six years which he passed in Bavaria—not even in the interval of three days which elapsed between the time when he received the fatal wound and his death—was anything elicited from him in the shape of a confession, or from others, that could form a clue to his name, his family, his previous residence, and his early life. It has been asserted that Earl Stanhope is in the possession of information which proves that Caspar Hauser was by trade a journeyman tailor or glover, and an inhabitant of one of the hamlets on the Austrian side of the river Salzach, which is part of the north-eastern frontier of Bavaria. He derived much of his importance from the report having been circulated that he was the rightful heir of a sovereign prince in Germany, and Von Feuerbach's credulity allowed him to receive that impression.

In a letter to Lieut. Hickel, of the Bavarian gendarmerie, Earl Stanhope says, "Soon after his arrival at Munich he was examined upon oath by the municipal tribunal in the affair of Caspar Hauser, in order to give evidence both generally and as to his own particular 'conjectures.'" In his first examination he made the following statement:—"The confidence which I originally placed in his (Caspar Hauser's) sincerity, although I had now and then detected him in telling falsehoods, and had heard the same from other persons, was first shaken by the circumstance that the last inquiries in Hungary seemed to me to prove that the apparently strong excitement which he experienced on hearing the Hungarian language, and particularly under circumstances which riveted his attention (such as the mention of the name of a castle and of a family in Hungary), could only be attributed to imposture."

Many of the German newspapers had reported that Caspar Hauser was a native of Hungary, and it is highly probable that he knew this previously to the experiments which were made with him by Lieut. von Pirch and Dr. Saphei. It had before been ascertained that he was unable to translate any word in the Hungarian language, but he knew the Polish words for "father," "mother," and "my dear," and this language is said greatly to resemble the Bohemian. Among other experiments, they caused to be read to him a catalogue of Hungarian proper names, with a view to the impression they should produce. Hauser maintained that Istvan (Stephen) was his own name. He had often told the Earl that he remembered this name was often applied to him in his early childhood, and he repeatedly told the person who was then his guardian that "something should come after Istvan, but with all his efforts he could not recollect." At each experiment with the Hungarian language he showed the most violent excitement, which always produced headaches. He appeared to fall into a deep reverie, or to be transferred to another world. The reader's attention is called to this exhibition of mental abstraction and to the headaches, because these were constantly shown whenever questions were put to him which he found it inconvenient or difficult to answer satisfactorily.

As early as the autumn of 1832 the Earl had communicated to Von Feuerbach and to others that he entertained a full conviction that on several important points Hauser's story must be unfounded. Three strangers had arrived in Nürnberg, in October, 1831, and desired an interview with Caspar Hauser; these were a Hungarian nobleman, his son, and tutor: their object was to ascertain whether he understood the Sclavonian dialect, with which they were well acquainted. They discovered that he knew nothing of this dialect; but when he heard in the Hungarian language, "Istvan goes to — Castle" (the name of which is suppressed out of delicacy to the feelings of innocent families), he was most violently excited and almost convulsed: with an emotion more violent than had before been observed in him, he cried, "Yes, yes, that is what I have so long sought." They repeated the name of a family residing in the neighbourhood, and he exclaimed, with apparent horror, "That is my mother." His agitation was so great as to create apprehensions for his health. He was taken home immediately. Arrived there, he exhibited his usual tranquillity; the only appearance of excitement that remained was remarked in his hand trembling on his snuffing a candle. Earl Stanhope asked him what the Hungarians had said to him. His reply was, "They mentioned to me the word which I have so long sought." "What was it?" Here, to the great astonishment of the Earl, he answered, "I don't know it any more." This must appear to every one very suspicious: that a name which had excited such emotion—which almost threw him into convulsions—should so soon have vanished from his memory, is perfectly incredible: it had been observed that his memory was remarkably tenacious. As a proof of the blind credulity of Feuerbach, it is only necessary to state that Lord Stanhope, immediately after this occurrence, went to Anspach to communicate it to Feuerbach, "who was then pregnant with his work upon 'The Example of a Crime on the Life of the Soul,' and had not yet come to a happy delivery:" he had met with an insurmountable difficulty in properly filling up the chasm in his work, namely, that period of time which Hauser had passed in the tower. Feuerbach at length consented to investigate the business. Accordingly an inquiry was commenced in February, 1832, by Lieutenant Hickel, and conducted by him with the greatest accuracy and ability; the result of which was, that Feuerbach himself declared that "nothing was to be sought or to be hoped in Hungary by Caspar Hauser;" and it proved, to all who were open to conviction, that his apparent reminiscences were positive delusions; that the name of the castle which he "had so long sought" must have been as new to him as that of the lady whom he supposed to be his mother. In the surrounding district of this castle nothing was known of a child having disappeared, and it was evident to the Hungarian nobleman and his son that Hauser had played a part with them which had often excited their laughter. Earl Stanhope observes that this occurrence induced him again to give the whole story a minute investigation, taking advantage of all the sources of information which were offered by Daumer's tract upon Caspar Hauser, and he found therein several circumstances, some of which appeared to him physically impossible, some quite incredible, some highly improbable, and some very suspicious.

His lordship was convinced that on several most important points the story was and must be unfounded. Hauser's own statements at that time seemed partly fictitious and partly misrepresentations, and were consequently not to be relied on in any way; and it was suspected that when he was released he was threatened with death if he should relate anything which could lead to a discovery, and consequently he was induced to conceal facts from a regard to his personal safety.

Feuerbach's description of Caspar Hauser's arrival in Nürnberg is evidently incorrect. Schmidt von Lübeck remarks very justly, in his tract upon Caspar Hauser, "The thousands of inhabitants who were scattered about in the country (it was Whit-Monday, a universal holiday in that region), and in all the neighbouring villages, were so many advanced posts which guarded the immediate approaches to the town; and to import through such a cordon so singular and striking an article of contraband as Caspar Hauser was, would have been quite hopeless and foolhardy: if however it had been attempted by the unknown individual, it might have been considered

as a miracle that not a single person of the many thousands should have remarked the singular spectacle."

Of his journey he appeared to know scarcely anything: this "journey" is hardly to be considered a long walk, and yet he could relate with accuracy everything that occurred in the house of the captain, in the guard-room, and in the tower. Feuerbach thought it possible that this journey had been performed in a carriage; if so, he must have retained a clear recollection of it, or his guide must have conveyed him in a state of sleep, which is scarcely probable: but why did not this guide leave him at one of the gates of the town—why should he incur the risk of bringing him into the vicinity of the *Unschlitt-Platz*, distant from all the gates? Had Caspar Hauser, through weariness, sunk down, as he said he had frequently done during the journey, the danger to his guide must have been imminent.

Feuerbach says that, when discovered by Weichmann the shoemaker, Hauser held out a letter to him, but said nothing; that when he was taken to the house of the military officer to whom the letter was directed, he said to the servant who opened the door, "Ae sechterre möcht ih wähn, wie mei volta wähn is;" and that to all questions put to him he only answered by a repetition of this jargon: but it is singular that both Weichmann and the servant of the officer should have given evidence that Caspar Hauser had spoken to them; and to another witness, his reply to the question, "Where do you come from?" was, "I do not venture to say." Again, a general and his aide-de-camp, who visited Hauser three or four days after his arrival in Nürnberg, told Earl Stanhope that he "could speak, not well, but intelligibly, and that he knew them three or four weeks afterwards, and remarked that they then wore pantaloons of a different colour."

Caspar Hauser states in his own narrative, that, on his first instruction in writing, his hand was seized by a person behind him, but that he did not turn to see who or what it was; he had never seen the face of a human being, and had no conception that there existed such another creature as himself—and this at the age of sixteen or seventeen. Feuerbach would not permit this to be printed, as he confessed it was calculated to excite doubts. It is evident that Feuerbach was determined that nothing should convince him that Caspar Hauser was an impostor: he had allowed his imagination to feast (if we may so say) on the idea that this was a case of greater curiosity than had ever before been presented to the psychologist, and, having raised up his idol, he could not be induced to destroy it. The judicial inquiries that were instituted were of course most likely to elicit the truth or falsehood of Hauser's story, but against these Feuerbach protested. He often said, "If one reads the official documents of Nürnberg, one must think that Caspar Hauser was an impostor: they ought to be burned."

It seems exceedingly probable that Hauser, on his arrival at Nürnberg, had no idea of playing the part he afterwards assumed. That he had been trained to act the impostor in some shape there can be little doubt, though the object is as much a mystery now as it was at the time of his appearance at Nürnberg; but it is evident that the questions put to him by his examiners, and the observations made by the press, suggested the character he thence adopted. After reading Von Lübeck's tract, in which it was asserted that Caspar Hauser had such a fine organ of smelling, that he could very well have smelled the unknown person if he were in the neighbourhood or even in the same house, he told Earl Stanhope that this was actually a fact; but it is strange that he had never before referred to the keenness of this faculty: his imagination, as well as his dexterity, was ever active in employing any hint, and as he became more and more involved in the story which had been suggested to him, and the longer he acted this part, the greater must have been his difficulty in extricating himself from it, till at length he found satisfaction in it, and, as Professor Daumer observes, "lying and deceit were become to him a second nature." Lord Stanhope says—"Amongst other obligations which I, as his foster-father, had undertaken towards the municipality of Nürnberg, was this: 'To adopt all measures which are requisite for his personal security.'" That this was done by the noble Earl is acknowledged by Feuerbach, who, in a conversation with him, said, "You cannot do more for him if you do not lock him up." Caspar Hauser was therefore placed under the immediate superintendence of Licut. Hickel, and was strictly forbidden to go out unaccompanied: in the hours not devoted to his education he was attended by a soldier of known courage in the service of Lieut. Hickel. These precautions were adopted in consequence of an attempt which had been made on his life, or rather in consequence of his having received a wound. It is doubtful indeed whether this wound was inflicted by his own hand or that of an assassin. Hauser said he remarked that the man who struck him wore "new boots;" but as this man was described by him as standing behind a screen until he stepped forward and struck the blow, it is scarcely probable that Hauser would think of noticing the boots whilst the instrument of death was glittering before his eyes and about to be plunged into his body; much less probable is it that he should remark that the man wore a ring on his fore finger, as he observed an elevation in his glove on that finger.

[To be continued.]

Echo.—The Königsplatz at Cassel is the finest square in Germany, if that may be called a square which is oval. It is the point of union between the Lower and Upper Towns; and the six streets which branch off from it, at equal distances in its circumference, produce a very marked echo. The sounds uttered by a person standing in the centre are distinctly repeated six times. The French erected a statue of Napoleon on the spot, and the Hessians observed that their favourite echo immediately became dumb, nor would they believe that a statue of their own elector would have equally injured the reverberation, by displacing the point of utterance from the exact centre. As the allies advanced, first the nose disappeared from the French emperor, then an arm, then he was hurled down altogether, a lamp-post was set up in his place, and the echo again opened its mouth.

New Act for the Extension of Vaccination.—The object of the Act 3 and 4 Vict., cap. 29, for the extension of the practice of vaccination, is, by the general use of tried and efficacious means, to prevent, as far as possible, the mortality and sufferings occasioned by small-pox. From the valuable information recently obtained by the registration of the causes of death, it appears that in 1837 there were in England only four diseases by which more people were killed than by small-pox. The number of deaths registered as caused by small-pox, during the two years and a half ended December 31, 1839, was 30,000, which gives about 12,000 deaths annually in England and Wales. It appears that the extremes of mortality at the Small-pox Hospital in London, amongst those attacked by the disease, have been 15 per cent. and 42 per cent. In some districts the mortality from small-pox is stated to be one in six of those attacked. But if, according to other statements, the average mortality be taken at one in four, or 25 per cent. of those attacked, the number of persons attacked in England and Wales must amount, on an average, to nearly 50,000 persons, or about 12,000 persons killed and 36,000 persons who recover subjected to the sufferings of disease, including in the case of the labouring classes loss of labour and long-continued debility, and in respect to all classes often permanent disfigurement and occasionally loss of sight. For the prevention of these evils, the means prescribed by the new statute are—first, the entire prohibition of inoculation with the small-pox; secondly, the general extension of vaccination.

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THE MOSQUE AT CORDOVA.

[Interior of the Cathedral at Cordova.]

The origin of this magnificent edifice, which, taken altogether, is perhaps one of the most extraordinary architectural works the world possesses, was the desire of Abd-el-Rahman, king of Cordova, during the brilliant period of the Moorish empire in Spain, to raise a mosque which should be to the faithful Mohammedans of the West what that of Mecca was to those of the East; and which should surpass its predecessor in richness and grandeur. He had the good fortune to find an architect and workmen able to carry out his designs. The work was commenced in 770. The site chosen was an elevated but irregular space, which on one side extended downwards to the banks of the Guadalquiver, and whereon had previously stood a Christian Gothic church. The remains of this edifice, and of various Roman works, among others a temple of Janus, were used in the construction of the new pile. M. Boisel, a French traveller, who visited Cordova about 1669, observed various fragments of columns, &c., lying about the mosque, which bore Roman inscriptions, several of which he copied. The expenses of the work were defrayed, according to the Moorish historians, by the booty that one of the captains of Abd-el-Rahman had obtained from the spoil of the cities of Narbonne and Gerona, which he had taken from the French and Catalans. The edifice fulfilled the purposes for which it had been erected, up to the epoch of the conquest of Cordova, in 1234, by the Christians, when that part of Spain passed under the dominion of Ferdinand III., king of Castile and Leon. The archbishop of Toledo now changed the mosque into a Christian church; but the city again falling into the hands of the Moors, it was not until the 29th July, 1236, the day of the feast of St. Peter and St. Paul, that Ferdinand retook it, and caused the cathedral to be finally consecrated for Christian worship, planting the standard of Leon and Castile at the same time upon its summit. The building, however, we may observe, continues even to this day to be known by the appellation of the mosque. It continued in its primitive state up to the year 1528, when a project that the chapter had long entertained, of turning the Moorish mosque into a Gothic cathedral, began to be carried into execution. The inhabitants of the city, to their credit be it remembered, warmly remonstrated against such a piece of barbarism—the friends of the arts were still more energetic in their opposition—the king himself, Charles V., was averse to the matter, but the clergy were all powerful, and ultimately obtained a reluctant permission from the monarch to fulfil their desires. Chapels were accordingly built in different parts of the mosque, one occupying the centre, and to make room for which great numbers of the beautiful pillars were cut away, and used for the purpose of adorning the new erections, which they helped to render still more incongruous with the surrounding parts. Additions and alterations of this kind have been continued from time to time ever since, to the very great injury of the architectural effect of the mosque, which, in losing the simplicity of its plan, lost its greatest charm. We now proceed to describe the building.

In its primitive state the mosque occupied a square

space measuring six hundred and twenty feet from north to south, and four hundred and forty feet from east to west. Of this two hundred and ten feet formed a court on the north end, in which were fountains for the purpose of ablution; this is now called the garden of the mosque. There were seventeen gates, all covered with plates of bronze of the most delicate design and workmanship. The interior presented a most unique and extraordinary aspect:—long and apparently endless vistas of pillars and arches extending in every direction. There were nineteen ranges of columns extending in perfectly straight lines from north to south; and the columns were placed at such a distance from each other as to form, when looked at from the east or the west, thirty-five ranges. The entire space thus occupied was divided into four unequal portions by a line of very massive pillars extending in a straight line (though not in the centre) from north to south, and by a similar line extending from east to west. Such were the arrangements according to the engraved plan in Laborde's 'D'Espagne;' and the total number of pillars, including those which surrounded the garden, was, according to the same authority, eight hundred and fifty. The following is the Arabic account of the original state of the mosque. "This magnificent mosque of Cordova surpassed all those of the East. It was six hundred feet long by two hundred and fifty wide. It was entered through nineteen gates, very spacious, and covered with plates of bronze of marvellous workmanship, the principal gate being covered with plates of gold; these led to its Alkibla through nineteen streets (aisles) of columns of different marbles, very precious and marvellously wrought, and these were crossed by thirty-eight streets from east to west, in each of which sides were nine gates. The number of the columns was one thousand and ninety-three. Aben Hazan says that the height of its Alminar, or tower, was forty fathoms, a little more or less. Above the highest cupola there were three gilt globes, and above them a pomegranate of gold. For the prayers at night were lighted four thousand seven hundred lamps, which consumed every year twenty-four thousand pounds of oil, and one hundred and twenty pounds of aloe and amber for perfumes. The lamp of the Mihrab, or secret oratory, was of gold, and of marvellous workmanship and size."* The present number of pillars, according to the 'Landscape Annual' for 1836, is six hundred and thirty-two. The chief alterations that have taken place in the arrangements we have described, are the stripping the splendid gates of their principal decorations and shutting up several of their number, and the lessening the number and interrupting the continuity of the ranges of the pillars by the modern erections, and thereby injuring the plan and harmony of the building.

The four fronts of this beautiful structure present walls of a remarkable solidity, about fifty feet high; they are crowned with battlements, and have at frequent intervals square flat buttresses rising their whole height. Between most of the latter are gates highly decorated with sculpture, which, although formed of a composition, keeps its beautiful workmanship uninjured even to this day, after centuries of exposure. The decorations are painted in a variety of brilliant colours, and exhibit in some parts a kind of mosaic work of baked earth. The four fronts differ not only in their ornaments, but in their height, circumstances which are accounted for by the necessity the artist was under of accommodating his work to the extreme taste of the Arabs for variety, and to the unevenness of the ground. This is so great, that in approaching the mosque on the north side it is necessary to make a considerable descent; whilst on the south, where it almost touches the bank of the Guadalquiver, one must make a still more considerable rise. In the interior we find no less than forty-six chapels ranged principally along the walls, and twelve altars. There are now seventeen ranges of pillars one way, and thirty-one the other; the aisles in the first direction being about seventeen feet broad, and those in the other about nine feet. Every column in all that vast forest of columns is of marble or other precious stone; we find them of jasper, porphyry, verd-antique, and of the choicest marbles—grey, red, green, blue, yellow, fawn-coloured, and white, most beautifully veined, streaked, ribboned, and watered. Their value must be enormous. Indeed one scarcely knows which to admire the most, their number or individual beauty. The variety which exists among them reveals the workmanship of different hands and of different periods; the great body of them are entirely Roman, but the Arab architect falling sometimes short of a base, sometimes a capital, made them himself in imitation of the remains before his eye. They have all been reduced to one uniform length of about nine or ten feet between the base and capital. The capitals of adjoining pillars are connected together by the Moorish horse-shoe arch, and above this arch is a second. A solemn gloom pervades all the place, for light is admitted but at infrequent intervals, and the lowness of the ceiling (about thirty-five feet) contributes to increase this effect. The wood-work of the roof is of the time of the founder, and is not less curious in its way than the other parts of this very interesting structure. Portions of it have been carried away to make musical instruments (guitars in particular), for which the wood is considered very suitable. Much, however, still remains of the original material, though concealed partially by the plastered ceiling. The joists are covered with paintings and ornaments in a very excellent state of preservation. If we may believe tradition, the wood was taken from a forest then standing on the opposite banks of the river, but of which no trees now remain. The different pieces of the roof have experienced so little alteration, that it is commonly said they were formed of an incorruptible timber. It is a species of pine, the alerce, and possesses a sweeter odour than any other kind now known in the country. Where the walls remain in their original state they are covered with a profusion of minute ornaments worked upon a plaster surface, containing every here and there sentences from the Korán inscribed within wreaths and garlands and other ornaments. The Gothic choir erected in the central part of the mosque rises like a distinct building; it is of immense size and very magnificent, according to some writers, whilst according to others it is not even sufficiently beautiful to alleviate our regret at finding the original edifice thus injured in its general harmony. The only erection that existed in the centre of the mosque, in the Moorish period, was a *mimbar*, or pulpit, a magnificent piece of workmanship, forming an apartment about forty feet square. It is now used as a chapel, and is greatly disfigured by the modern paraphernalia of Catholic worship. Nothing can exceed the elaborate beauty of its Arabesques, which almost entirely cover the walls; yet even these could not escape the hand of the spoiler, for part of them have been removed to make way for a modern altar. The roof rises to about the height of fifty feet, and consists of an octagonal dome, richly painted, carved, and inlaid. "But the Zuncarron, or chapel of Mohammed, against the southern wall, surpasses in beauty every other part of the mosque. There are three enclosures (for chapels they are not, though so called), separated from the rest of the cathedral and from each other by columns of jasper and the richest marble, supporting arches in double tiers of the most grotesque forms—of a style, in fact, not to be seen elsewhere in the Peninsula. The centre enclosure at once fixes the attention. In the wall is a horse-shoe archway leading into an inner room, and around it is a deep facing of Arabesques of the most elegant patterns and brilliant colours, red, black, and gold, formed by a mosaic work of crys-

* Conde, 'Historia de los Arabes,' tom. i., cap. 24 and 28.

tal of inimitable beauty. About this are long straight bands of Arabic inscriptions in large gold letters on a black ground, or *vice versâ;* and above it, the wall rises, clothed with tracery in relief, to the roof, which is lofty, lantern shaped, richly gilt, and lighted by small apertures or windows without glass. The apartment within the arch is an octagon of fifteen feet,—its height the same; the walls are ornamented with columns and arches in relief; and the roof is of pure white marble in a single piece, carved in the form of a scallop-shell. This was the Maksura, where was deposited the Korán."* When illuminated, and more especially on the later nights of the Moorish Ramadan, by the massive silver chandeliers that hung from its centre, the gorgeous beauty of the Zancarron must have surpassed even everything our imaginations can conceive of Eastern magnificence. The garden, or court of orange-trees, as it is sometimes called, was originally surrounded on three sides with a portico supported by sixty-two columns, having somewhat the appearance of the cloisters of our cathedrals; on the fourth side was the mosque. The openings into the aisles of the latter are now closed up, and the portico on the north side has been removed, and various halls and apartments erected in its place. This garden is a very delightful spot. It is elevated upon an enormous cistern, and contains but four or five feet of soil. This, however, appears to have been amply sufficient, for there are a great number of flourishing orange and citron trees, and some few cypresses, all very ancient. There are also several fountains of gushing water, falling into marble basins filled with glittering shoals of gold and silver fish. The chief entrance to the mosque lay through this garden, where the comers performed their ablutions, and then passed barefooted into the sacred building. The garden itself was reached by a large horse-shoe archway thirty feet high and fifteen broad, and which, in reference to one great object of the many visitants of the mosque, was beautifully designated the *gate of pardon.* Over this rises a square tower to the height of nearly three hundred feet, which is partly of Moorish, partly of modern construction. On the archway is the following inscription from the Korán: "O true believers! come not to prayers when ye are drunk."

HISTORY OF A COAT.—No. IV.

[Concluded from No. 546.]

We have hitherto said nothing concerning the colour of the cloth whose production we are describing; the wool itself has a kind of dirty white tint, and must be dyed before it is fit for use. The dyeing is effected before the wool is spun, for forming cloth of mixed colours; after it is spun into thread, for tapestry-work; but after it is both spun and woven, for the generality of purposes: in the last case, the dyeing is performed after the scouring, by which the oil is removed, but before the milling, which we have yet to describe. The subject of dyeing is too extensive to be here entered upon at much length; but we will briefly speak of the processes by which a piece of cloth is dyed black.

In order that the black dye may be successfully made, it is necessary that the cloth be previously dyed some other dark colour. The finest and deepest black is obtained after a blue dye has been given to the cloth; but a cheaper black results when the cloth has been previously dyed with a brown or root-coloured ground obtained from the root of the walnut-tree or from green walnut-peels; the preparatory blue dye is obtained from indigo and woad; and the nature of the operations will be sufficiently indicated by the following modes of imparting the black dye, these being merely two modes out of many that are adopted. The blue-dyed cloth is boiled for two hours in a solution of galls, and is afterwards kept for a similar length of time in a bath composed of logwood and sulphate of iron. Or, a bath is prepared of a pound and a half of yellow-wood, five pounds of logwood, and ten pounds of sumach, which is the proportion of ingredients for every fifteen yards of deep-blue cloth; the cloth having boiled in this bath for three hours, ten pounds of sulphate of iron are added, and the cloth remains for two hours longer. In either case, the blue dye used previous to the black is made to unite to the cloth by means of a *mordant*, or fixing liquid; and the black afterwards unites with the blue; indeed the general processes of dyeing may be characterised thus:—a mordant, which has an affinity for the woolly fibres as well as for the dye-stuff, is first applied to the woven materials, and serves as a link or medium through which the dye is made to adhere to the cloth; for it often happens that the two latter have no tendency to unite without the aid of a third body: the dye-stuffs being principally solutions of vegetable substances, employed at a high temperature. The nice precautions necessary to be taken by the dyer, we, of course, cannot dwell upon here.

After the scouring and dyeing the cloth is milled, by a process very similar to the fulling described in the last paper. A piece of cloth, sixty-two yards in length, is put into a trough, together with about six pounds of soap spread over the surface. The cloth is then beaten for three hours by very heavy stocks or mallets, it being turned occasionally, to present a new surface to the action of the mallets. After three hours' milling, the piece of cloth is taken out of the trough, soaped again, and re-milled in a similar manner; this is done a third and even a fourth time. The enormous amount of beating and pressure which the cloth thus undergoes produces remarkable effects on it: the length is reduced from sixty-two yards to forty yards; and the width from a hundred inches to sixty inches; the fibres are found to be matted and clotted together in a manner which renders it impossible to disunite them; and the threads are wholly concealed by the felting which has been here effected. It is in this process that the serrations in the fibres of wool, of which we spoke in a former paper, cause that peculiar entanglement called felting. The blows of the mallets on the cloth force the small fibres in various directions; and if two neighbouring fibres happen to be so placed that their serrations interlock or catch in one another, this is a miniature instance of the felting or milling which, on the large scale, has so peculiar an effect on the piece of cloth. Not only do both sides of the cloth acquire a nap or pile by the bristling up of the fibres, but a piece of woollen cloth can be safely left with a cut but unhemmed edge, because the fibres of one thread interlace with those of the adjoining one, and thus prevent the thread from ravelling out. We trust the reader will have perceived, from this description, that the pile of a piece of woollen cloth is not a substance laid on the woven material, but consists of some of the fibres of the woven threads, raised up, and entangled one among another.

The nap just described is, however, too irregular and rough to suit our ideas of neatness and elegance; and in order to remove a portion of this roughness, the cloth goes through the processes of *teazling* and *shearing*,—the first of which drags up the fibres so that their points shall, in some degree, be presented uppermost, and the second shaves or cuts off a portion of these fibres from the whole surface of the cloth.

Teazling is a process which differs from almost every other in modern manufacture in this circumstance, that although it is strictly mechanical, no combination of machinery has yet succeeded in effecting it so well as a small vegetable production. The fibres of the cloth have to be raised up by a kind of scratching action, and nothing has yet effected this so well as the sharp hooked points of the common *Teazle* (the *Dypsacus fullonum*). Their excellence for this purpose seems to depend on the

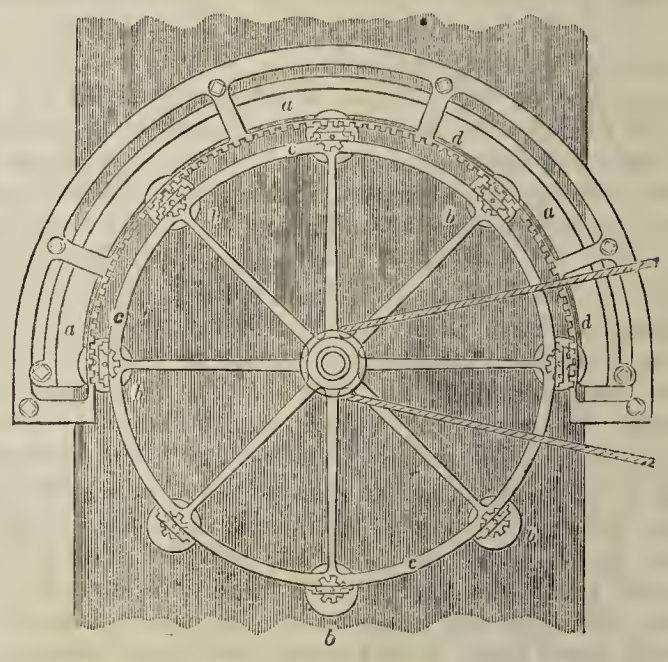
* 'A Summer in Andalusia,' vol. i., p. 295.

following circumstance, that if the hooked points catch in a knot of the cloth, they break off without tearing a hole in it; whereas steel or iron points, worked by machinery, would almost certainly drag the cloth into holes more readily than they would yield by fracture. It is not improbable that some mode will be hereafter devised which will effect this process by machinery, especially as fifteen or twenty hundred teazle-heads are required for every piece of cloth; but hitherto all such modes have been unsatisfactory. Referring to the last Supplement, p. 384, for a representation of the teazle, and an account of its nature, cultivation, market-price, &c., we will here proceed to describe how it is employed.

Under the old system a number of teazle-heads were set close together in small wooden frames of a convenient shape to be worked by hand. The cloth was drawn over a frame constructed of boards laid in a sloping direction and covered with hair-cloth; and was then scraped or rubbed with the teazles from one end to the other, being kept constantly wetted with water during the whole time. The cloth was then laid on the shearing-boards, which were wooden planks covered with coarse hair-cloth, forming a sort of hard cushion; and the raised fibres of the cloth were cut or sheared off with long heavy shears, which were pressed close to the cloth by means of leaden weights, and which gradually slid forward at every motion or cut, until the cloth was sheared from edge to edge. The cloth was then returned to the teazling-frame,—more fibres were raised, and these fibres were cut off at the shearing-frame. This alternation was repeated three times, finer teazles being employed as the process approached completion.

But in the more modern system the two processes of teazling and of shearing are separated, and each one is performed by steam-power. The hand-teazles are now superseded by the *gig-mill*, consisting principally of a cylinder covered nearly all over its exterior surface with teazles, or, in some few cases, with metallic wires. This cylinder revolves; and the piece of cloth, while passing from one roller to another, is pressed against the points of the teazles so that the fibres are effectually worked up. When the hooks of the teazles become filled with flocks of wool, they are taken out of the cylinder and cleaned by children with a small comb; where the metallic teazles have been employed with any degree of success, their points are cleared by a revolving brush connected with the machine. Different varieties of the gig-mill have been introduced in proportion as the advantages of employing machinery became clearly understood.

The shearing used to be effected by the shears, as we before stated, and was a process requiring much manual dexterity, since the nap had not only to be cut in an even and parallel manner, but the shears had to be shifted after each cut to just such a distance (and that a very small one) as to make another cut in the proper place. As the shears were difficult to hold and manage, machines were contrived, in which the shears were fixed to a carriage which, moving slowly over the cloth, caused their cutting edges to work upon every part of the nap. But still, as the cuttings were made by separate and distinct movements of the shears, the process was not of that continuous nature which we are accustomed to meet with in modern manufactures; and attention was directed to the construction of machines for the more effectual performance of this process. Many such have been recently invented, of which we will briefly describe one, that of Mr. Oldland. The shaded portion of the annexed cut represents a piece of cloth, and the lighter parts show the shearing-machine at work on it. (*c*, *c*) is a large working wheel, made to rotate by a band and pulley connected with its axis. Round its circumference are fixed eight little circular cutting discs (*b*, *b*), and each disc has a toothed pinion which works in a toothed semicircular rack (*d*, *d*); so that when the large wheel is rotating, the small cutters have a curious motion, not much unlike that of a planet, that is, they all revolve round the centre of the large wheel, and at the same time each one rotates on its own axis. (*a*, *a*) is a semicircular cutting blade, on whose edge the circular cutters rest in such a manner as to form a series of scissors or shears: the nap is caught up between the edge of the semicircle and the edge of the disc, and then cut off. The machine is gradually driven from end to end of the piece of cloth, shearing the nap as it goes in semicircular sweeps or curves. We may here remark that the introduction of shearing-machines occasioned much rioting and violent conduct among the hand-shearers some years ago; but the great superiority of the machine method over that by hand has gradually silenced all opposition, so that the latter is probably now scarcely known in England.



When the shearing is completed, the cloth is well brushed, in order to remove the loose particles of wool, and to lay the nap even and smooth. This operation used to be performed by hand, but it is now effected by means of cylinders having hair brushes on their circumference. The piece of cloth is conducted over a system of rollers, to extend it and to draw it forwards: it then passes over one of the brush-cylinders and under the other; and as both cylinders rotate rapidly, the cloth becomes well brushed on both sides.

The cloth is next subjected to the process of pressing, by which a smooth level surface is produced. The piece is folded backwards and forwards in yard lengths, so as to form a thick package, which is placed either in a screw-press, or, in modern establishments, a hydrostatic press. Sheets of glazed paper are placed between the folds of the cloth, in order to prevent the contact of two surfaces of the latter; and at the end of every twenty yards, three hot iron plates are inserted between the folds, laid side by side, so as to cover the whole width of the cloth: thin sheets of cold iron are placed between the cloth and the heated plates to moderate the warmth. When a large package is built up, it is subjected to severe pressure in the press, where it remains till the plates are cold. The cloth is now taken out and refolded, in such a manner that the creases of the former folds may come opposite to the flat surfaces of the paper, and be removed by a second pressure. If the heat of the plates be too great, a satin-like lustre and smoothness are given to the cloth, which is liable to unsightly stains if afterwards spotted by rain.

By some modern machines the brushing and pressing are effected in a few minutes by the combined action of brush-cylinders, a steam-cistern, and calendering or pressing rollers. Indeed throughout the manufacture we have contented ourselves with describing the most usual modes of effecting the object in view, without attempting to describe all the various ingenious machines which have

been from time to time introduced for the more speedy performance of the required processes.

Our piece of cloth is now finished; and we have only to say, that the manufacturer usually packs up the cloth in bales containing twenty or twenty-five pieces: the bale is first enclosed in paper, and then in canvas, and is thus transmitted to the purchaser.

The method by which a piece of cloth is measured and cut to the proper dimensions for forming a coat would be difficult to describe in writing, although we can easily enough form a conception of it: our object has been not so much to speak of the means by which the scissors and the needle fashion a coat out of a piece of cloth, as to convey some idea of the process by which the woolly covering of a sheep becomes a smooth and elegant woven material from whence a garment may be made. Although cloths of very different degrees of quality are made, yet the routine of manufacture is pretty much the same for all; indeed it is probable that in no country in the world does the coat of the nobleman differ less from that of the artisan than in England. Thanks to machinery, our working population is more neatly and comfortably dressed than at any former period: a journeyman in his Sunday attire would not be seen in a coat of worse quality than broad-cloth; and if George Fox, the founder of the Quakers, were again amongst us in his leathern doublet, he would see how neatly labouring mechanics, to which class he belonged, have been enabled to increase their comforts by the cheapening effects of machinery on the prices of clothing. If it be objected that we should not value a man by the quality of his coat, we would remark, on the other hand, that neatness of person and dress is one of the elements of moral advancement by inducing self-respect.

HORSE ARMOURY IN THE TOWER.—XIII. James I.

[James I.]

From the lengthened consideration we have been induced to bestow on the characters and actions of the principal actors in the chivalry of the days of our Maiden Queen, we have neglected to notice (what perhaps, in our present series of articles, should be treated with as much minuteness) the fashion of their habiliments and the forms and uses of their weapons of offence and defence. Although governed by a woman, the subjects of Elizabeth were as warlike as those of any of her predecessors, and the masculine character of the queen, bold, courageous, and fearless of danger, led her to patronise sports of a hardy and invigorating character, that her people might not sink into effeminate habits, but retain the fearless and active dispositions of their ancestors. From this feeling, joined to the desire for warlike expeditions to foreign shores, which seemed to actuate the whole British nation in the days of Raleigh and Essex and Sydney, may be attributed the many improvements and importations from Italy and Spain effected in the fashion of armour and warlike instruments at that period. Another cause of th

very different form which the armour assumed during the latter part of the reign of Elizabeth to that in which it had hitherto been manufactured, may be found in the unprecedented fashion of the dresses of the civilian at that date; armour in all ages having taken its predominant form in some degree from the common dresses of the day.

Armour, however, was only used to cover the upper portions of the body, the large trunk hose rendering it inconvenient to use armour for the thighs and legs, which, if made to cover them, would require such a load of iron as the strongest warrior of that age would have been unable to endure. Besides, the profuse and expensive ornaments which enriched that portion of apparel would in that case have been hidden from the admiring gaze of the public, and would not have excited the envy of brother knights and courtiers. It was, however, imperatively necessary to cover the doublet, if the warrior or tilter did not wish to be run through by the first lance; and consequently the breastplate had to be made of the form of that article of apparel which at this time obtained the name of the long peascod-bellied doublet, from its being made long and projecting in front, in the form of a pea-shell. According to Stubbs it was also "quilted and stuffed with four, five, or six pounds of bombast, the exterior being of satin, silk, taffata, grograine, chamlet, or gold and silver stuff, slashed, jagged, cut, carved, pinched, and laced, with all kind of costly lace of divers and sundry colours."

In imitation of all these ornaments, the armour was much embossed and ornamented; and it is probably to this kind that we must refer that worn by Sir Walter Raleigh in one of the court galas, when he appeared, according to Oldys, in solid silver armour, with sword and belt blazing with diamonds, rubies, and pearls.

The breastplates were not only larger, to cover the well-padded doublets, but they were also made thicker, that they might be bullet-proof; fire-arms becoming of more extensive employment in warfare. The tassets were of one piece, but generally marked in imitation of several. For a head-dress, the morion was held in the greatest esteem, being worn without a visor, and much ornamented with figures in relief. It was of a conical shape, much resembling the polished part of an acorn, the situation of the jointure of the cap being occupied by a projecting rim turning up in front.

The fire-arms introduced at this period were carabines, petronels, dragons, muskets, and calivers. The carabine, or carbine, was a small firelock used by the cavalry, and smaller than that employed by the foot-soldiers. The petronel obtained its name from *poitrinal*, being fired with its straight and square butt-end held against the chest. The dragon was so called from its muzzle being generally ornamented with the head of that fabled monster, and the troops who used it subsequently acquired the name of dragons and dragoons from the circumstance. The musket was introduced from Spain, and used with a rest in the form of a hay-fork, on which the left hand was placed when the piece was fired, instead of holding the barrel. The caliver was soon afterwards brought into use, the name being obtained from the *calibre* of the bullet used for the piece. Both the musket and caliver were match-lock pieces, the wheel-lock being too expensive for general use. Although the advantages of fire-arms would seem to be too apparent to be overlooked by military men, the prejudice in favour of archery continued so great in the sixteenth and seventeenth centuries, as to render the employment of such arms very unpopular. Among the larger fire-arms, bombs, grenades, and howitzers were introduced between the years 1588 and 1594.

The sports of the common people in the reigns of Elizabeth and James, at least those at all connected with the subject of the present paper, consisted of tilting or running at the ring, though this was rather confined to the middling classes (leaving tournaments to the nobles of the court); and running at the quintain, a machine consisting of a long beam made to swing at its centre on the top of another upright beam; and the dexterity of the player consisted in running against one extremity and hitting a certain mark full, and so as to prevent being hit by the other end of the beam as it swung round the upright post in consequence of the blow. One of these instruments is still to be seen on the green at Hoff-ham near Maidstone in Kent, being kept in constant repair in consequence of the terms of an old tenure by which the manor is held.

In the reign of James I. armour was but little worn, and it is said that that monarch remarked of armour, "that it was an excellent invention, for it not only saved the life of the wearer, but hindered him from doing hurt to anybody else." Such a remark was very likely to proceed from this pusillanimous prince, who, although represented in the collection of armour in the Tower as habited in an iron panoply of the date at which he reigned, probably never wore a suit of armour in his life.

The armour represented in our engraving, copied from the figure in the Horse Armoury, is of the date of James I., and forms a full tournament suit with coverings for the thighs and legs, both, as we have said above, of very rare occurrence. The large lance he holds in his hand, resting on the ground, was only used for tournaments, being too unwieldy for serious encounters.

CASPAR HAUSER.

[Concluded from No. 547.]

Vanity may be considered as Hauser's ruling passion, and he could ill brook the indifference with which he began to be treated. The story of the attempt at assassination again raised him to notoriety, and indeed induced many persons to think there was more truth in his story than they had previously attached to it. Of course it was asserted that those who had been concerned in his long imprisonment were fearful of discovery, and had sought his destruction as a means of securing their safety.

We now come to the final scene of this mysterious story. For some time previous to the death of Caspar Hauser, he had evinced a desire to be free from the attendance of the soldier who had been appointed his protector during his walks; and during the absence of Earl Stanhope, M. von Feuerbach was prevailed on to revoke the order for his being restricted in his walks, and he received permission to go alone into the streets, but not out of the town, consequently not to the court garden; but to this place he went on the 12th December, although he had been cautioned not to do so, because he had been invited to meet a stranger there. Till this period he had evinced apprehension of danger, and was, apparently, as anxious to be protected as his friends were that he should be preserved from violence. But he was again becoming an object of little interest, and his vanity took the alarm. In the court garden he met a man, but not the same that had made the appointment. This man gave him a silk bag; and as Caspar Hauser was in the act of sitting down, he received a wound in his breast from a dagger which the stranger had kept concealed. On the former occasion of his being wounded, the person who stabbed him came upon him suddenly, and yet he could notice the "new boots" and the "ring" which the assassin then wore. Now he walked deliberately up to his assailant, whom he had every opportunity of examining minutely, but of his person he could give but a vague description; his cloak had but one cape, which, he believed, came below the sleeves, but he could not mention its colour. Caspar Hauser, on receiving the wound, let the bag fall and hurried home to the residence of M. Meyer

the schoolmaster, under whose care he had been placed, and to him he showed the wound he had received; but to the urgent questions that were put to him, to ascertain the circumstances which had occurred, he would give no answers for a considerable time. It is evident that he had no idea that the wound was of a very dangerous nature; for on the evening of the sixteenth (the day before his death), he talked of finishing some pasteboard-works after his recovery. Indeed the wound was not considered as likely to be fatal by his medical attendants: it was "two inches and a half under the centre of the left breast, and three inches from the middle line of the body, sharply drawn with two edges that were quite sharp," and, from one end to the other, three-quarters of an inch long; the sides hardly opened the twelfth part of an inch, so that it could only have been inflicted by an instrument which was even to its extremity "sharp and two-edged." (*Report of Dr. Heidenreich.*) The Dr. also reported that "it may not have been an ordinary dagger;" and that "it did not require the knife of an assassin, for what is called a Low Country dagger was exactly qualified to inflict such a wound." Another physician who attended considered the instrument with which the wound was inflicted must have had "the form of the blade of a common knife;" and the opinion of another was, that a wound similar to that which Caspar Hauser had received, would not have proved mortal if inflicted one rib lower.

At the time of this occurrence Hauser's story had again ceased to excite much attention: the persons connected with his early imprisonment were in no danger of discovery, and consequently would have better secured safety by permitting their victim to fall into insignificance, than by again exciting public attention. But even supposing they saw the necessity of Hauser's death, it is highly improbable that they would have attempted to effect their purpose in such a public place, and at a time when the deed was certain to be discovered in a short time, and the murderer easily pursued. It is to be supposed that an assassin would have aimed at the heart, and not have struck in an oblique direction; indeed his object must have been the immediate death of his victim: if one blow had proved insufficient, another and another would have been inflicted. But it is unnecessary to dwell on this subject; every circumstance tends to prove that Caspar Hauser was totally unworthy of credit; and it is scarcely to be doubted that the wound was inflicted by his own hand, but without the design of self-destruction. The physician of the municipality observed, that "all those persons who are wounded by the hand of another are anxious with respect to their wound and to their fate; but those who wound themselves do not show any concern about it, remain indifferent, and hardly take the trouble of asking any questions as to their situation, which last was the case with Caspar Hauser."

In conclusion, Earl Stanhope observes:—"First, a very sharp and very slight instrument, which inflicted the wound, might by pressure, not by a blow, have penetrated much deeper than was intended, as soon as it overcame the resistance of his coat, which was wadded.

"Secondly, Caspar Hauser, who, about a week before, had been seriously admonished on his tendency to lying, and had been shown the consequences of that tendency, knew that a great many persons did not consider him as worthy of credit: he had also learned from Feuerbach that I entertained doubts on many parts of the story: he might have expected a full and minute investigation of all his statements, and had perhaps the intention, through a pretended assassination, to place the stamp of truth and of importance on his story, as also to revive the general interest, and to show that he could not live in safety at Anspach, and must be taken elsewhere.

"And thirdly, the pretended assassination of Caspar Hauser is by no means to be considered as an insulated fact, or as one related by a person worthy of credit, but stands in connection with his other statements, and with his well-known disposition to relate falsehoods and to excite attention."

ANECDOTE OF THE GREAT REBELLION.

The Attack of Prince Rupert, in 1642, upon Caldecote Hall, in Warwickshire, and the gallant and extraordinary Defence of the Inmates of the Mansion.

[From a Correspondent.]

The following anecdote is, we believe, little known, even in the neighbourhood of Caldecote. The hall, to which this parish has given its name, is a handsome stone mansion, with a river within a short distance of its front, and adorned with plantations and ornamental grounds. Dempster Heming, Esq., resides at this hall; and the estate of Caldecote, and some others in the neighbourhood, are his property. Within a few yards of one end of the mansion stands the small but interesting church of Caldecote, partly hid by some fine luxuriant trees, by which it is shadowed. In this church there is a marble monument bearing the following inscription:—"Here lieth the body of George Abbott, late of Calldccoate in Warwickshire, Esq., whose eminent partes, virtues, and graces, drawne forth to life in his exemplary walking with God; his tenderness to all the members of Christ, who frequently fled to his charity in their wants and counsell in cases of conscience; his exact observation of the Sabbath, which he vindicated by his pen, and in which, August 28, 1642, God honored him in the memorable and unparaleld defence of the adjoining house, with eight men (besides his mother and her maides), against the furious and fierce assault of Prince Rupert and Maurice, with eighteen troops of horse and dragoones; his perspicuous paraphrases on the books of Job and Psalms; his judicious tracts of publick affaires then emergent; his knowne integritie in publicke imployments; rendered him one of a thousand for singular piety, wisdome, learning, charity, courage, and fidelitie to his country, which he served in two parliaments, the former and this present, whereof he died a member, Febru. the 21st, 1648, in the forty-fourth year of his age. This monument was erected to his memorie by his dear mother and executrix Iohane Purefoy, the wife of Colonel William Purefoy, his beloved father-in-law, the 28th day of August, Anno Domini 1649."

The narrative itself is taken from an account of the attack upon Caldecote furnished by a gentleman in the neighbourhood. It is contained in an old MS.; but whether this MS. be or be not itself a copy of some older original, is not known.

"The cavaliers having notice, thereupon informed Prince Rupert of a worthy gentleman's house and habitation, by name Mr. W. Purfery, of Caldecote, a worthy member of the House of Commons, and a gentleman of a fair estate, who lived in a very strong and well-built house of stone. Upon which intelligence given to this prince of plunderers, he, with above five hundred of his forces, upon a Sunday morning, a little before prayer time (a fit day and fit time of the day for such plunderers, thieves, and robbers, to act their wicked designs of thefts and rapines), came to Caldecote aforesaid, and beset this gentleman's house, with an intent to plunder and pillage it, himself being absent from home, and there being within only the mistresse of the house, one or two daughters, one Mr. George Abbot, her son-in-law, a very resolute and stout young gentleman, three serving-men, and four maid-servants.* The Prince, being come to the house, sends unto them to open the gates and to deliver up the house to him: the gentleman, and all within with him, being very courageous and cheerful, and having good

* The monument says, "with eight men (besides his mother and her maids);" the narrative gives only four men, with fou. maids, the mother, and her daughters.

store of muskets, powder, and shot in the house, refused so to do; but stood upon their guard, resolving, by God's assistanee, to fight it out, rather than to yield themselves to the perfidious eruelty of him and his accursed eavaliers; and thereupon the young gentleman took forth a dozen muskets, taught the women how to charge them, while he and the other men discharged them. Prinee Rupert, thus affrontcd, gave command to his eavaliers to set upon the house and to break open the outmost gatcs, to come into the yard or eourt; but as his captains and soldiers entered in, the said Mr. Abbot and his men shot so thick and quiek at them, and showed themselves (by God's assistanee) sueh notable marksmen, that at the very first outset they slew one Captain Mayford and Captain Shute, and after that one Captain Steward; and ere they had done, about fifteen more of their soldiers, whereof some were officers in arms, the men within still shooting at them without intermission, and the women, who had amply learned their art, did their work and aeted their parts most nimbly and eheerfully; and when their bullets began to fail, they fell to melting all their household pewter, and, having bullet-moulds in the house, speedily made more, and notably supplied that want faster than they could be spent; and thus the business was so plyed, and with such dexterity by them all in their appointed ways, God wonderfully enabling them, so that Prince Rupert was sorely put to it; and having seen so many of his men slain, and seeing he eould not so easily enter the house as he and his eompany expeeted, he fired the barns, stables, and outhouses, which caused a mighty smoke, and began to smother them much in the house, and to hinder their sight from acting as they did before, and now also their store of powder was well nigh all spent; hereupon therefore Mistresse Purfery fell upon her knees, and craved quarter for herself and family only. Whereupon it pleased the Lord to mollify the prinee's heart towards her, who asked her what she would desire of him? She answered, 'her own life, and the lives of those that were within.' With her eertifying who and what members thcy were, and that only her son-in-law, Mr. Abbot, and his three servants, were all the men or male kind in the house, which did what was done, which, when Prinee Rupert heard and understood for eertain of the smallness of their number, and considered their brave valour and resolution, he admired and wondered at it, raised the gentlewoman from her knees, saluted her kindly, and granted her request fully and freely; and notwithstanding the slaughter of so many of his men, and some commanders, as aforesaid, went into the house to see Mr. Abbot and the rest, who had so bravely behaved themselves; whom when that he saw and that it was so indeed, he was much taken with their notable valour, saving their lives and house from plundering, saying to Mr. Abbot that he was worthy to be a chief commander in an army."

Few persons of the present day, we think, will be disposed to acquiesce in the propriety of the vituperative epithcts so lavishly bestowed in the above paper upon Prinee Rupert, whose conduct on the oeeasion appears to us to be eharacterised by great forbearanee and generosity. It will be pereeived that the name of the mistress of the mansion is spelled in the preceding narrative Purfery, and on the monument Purefoy: the latter is the correct spelling. In the chureh of Fenny Drayton, Lcicestershire, a parish which adjoins Caldecote, there are many monuments erected to the memories of these Purefoys, who were at one time the proprietors of Drayton and other estates in the neighbourhood. The remnant of this family has long been settled in Ireland.

The Rhinoceros Hunt.—The people inhabiting the woods in the province of Tshantburi are in the habit of hunting indiscriminately tigers, bears, and rhinoceroses, as well as stags and wild cows. Their mode of dealing with the rhinoceros is very remarkable. Four or five men will arm themselves with poles made from the bamboo, after taking care to harden the sharp point which they give to one of the ends in the fire. Thus equipped, they sally forth and make for the animal's haunts, calling out and clapping their hands for the purpose of alluring or disturbing him from his covert. As soon as they see the enraged animal approach them (and his rage is expressed by his opening and snapping his huge jaws violently together), they prepare to receive him by holding out the point of the pole in a direct line with his foaming mouth, and upon the favourable moment presenting itself, they drive the pole with astonishing nerve and adroitness not only down his throat, but into his stomach, and then take to their heels right and left. The rhinoceros sets up a frightful howl, falls down on the ground, and in an agony of pain rolls himself about in the dust with hideous howlings and distortions: the hunters in the mean while begin clapping their hands and vociferating their song of triumph, in the midst of which they rush upon the monster as soon as he appears fairly exhausted by loss of blood, and dispatch him without hazard or difficulty.

The Cotton Manufacture.—"It is worthy of remark," says Mr. Rickards, "that most of the wonderful discoveries which have raised these manufactures to their present unrivalled superiority, such as roller-spinning, the jenny, the carding-machine, the mule, &c., owe their existence to the natural genius of uneducated men, moving only in the class of common workmen or labourers: this is their proud boast. The improvements through which they have attained their present perfection are all ascribable to the same class; whilst, I believe, it may be safely added, that every one of the great fortunes and immense establishments existing in the manufacturing districts may be traced to the minute savings of common operatives, who, from the smallest of small beginnings, have, by prudence, skill, and unremitting perseverance and industry, raised themselves, with unexampled rapidity, to a pinnacle of wealth and importance which, but for its existence, could scarcely be believed. This then is a state of society, with its magnificent institutions, essentially popular in its origin; its progress and present results owing little to science—nothing to patronage—but all to the unaided efforts of natural genius and practical experience; often obstructed but never encouraged by legislative enactments; and consequently exhibiting a striking example of the benefits of non-interference in matters where nothing is wanting but equal protection and security to ensure splendid success."

Influence of the Factory System upon the Condition of Women.—One of the greatest advantages resulting from the progress of manufacturing industry and from severe manual labour being superseded by machinery is its tendency to raise the condition of women. Education only is wanting to place the women of Lancashire higher in the social scale than any part of the world. The great drawback to female happiness among the middle and working classes is their complete dependence and almost helplessness in securing the means of subsistence. The want of other employment than the needle cheapens their labour, in ordinary cases, until it is almost valueless. In Lancashire profitable employment for females is abundant. Domestic servants are in consequence so scarce, that they can only be obtained from the neighbouring counties. A young woman, prudent and careful, and living with her parents from the age of 16 to 25, may in that time, by factory employment, save 100*l.* as a wedding portion. I believe it to be the interest of the community that every young woman should have this in her power. She is not then driven into an early marriage by the necessity of seeking a home; and the consciousness of independence in being able to earn her own living is favourable to the development of her best moral energies.—*Report on the Condition of the Hand-Loom Weavers, by W. E. Hickson, Esq.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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CASTLEACRE PRIORY, NORFOLK.

[Castleacre Priory, Norfolk.]

The considerable village of Castleacre, situated about four miles north of Swaffham, on the banks of the river Nar, is supposed to have derived its name from the castle built here by one of the followers of the Conqueror, William de Warren, Earl of Surrey, who founded also the magnificent priory which forms the chief subject of this paper. A brief preliminary notice of the castle can, however, hardly be considered out of place. This fortress occupied an area of above eighteen acres in extent, and the remains which still exist indicate very clearly its original strength and grandeur. It was erected on the slope of a gentle eminence, and was surrounded by an embattled wall seven feet thick, with a broad and deep moat on the outside. Three immense buttresses built over the moat supported and strengthened the wall. The interior consisted of an outer and an inner ward; the keep, a lofty circular building of great size and thickness, was in the latter. The principal street of the village now runs directly through the site of the castle, and beneath one of its main gateways, which consists of two gates, one within the other, with a portcullis between, and of two circular bastions to defend the passage. This gateway is at the north end of the street: there are traces of another very similar one at the south. About the centre of the street we find a third gateway communicating with the outer ward, and near the north gate the remains of the chapel of the castle, now converted into a private residence.

The priory was founded by the Earl of Surrey as a cell to that of Lewes, in or before 1085, and was intended for monks of the Cluniac order. Tanner speaks of it as dedicated to the blessed Virgin simply; but Blomfield, in his 'History of Norfolk,' states the dedication to have been to God, St. Mary, and the Apostles Peter and Paul. The founder settled upon it the church of Acre and various other churches, with their advowsons. This grant was confirmed by Herbert, Bishop of Norwich, who certified that the monks of Acre had entered upon that church with his consent, and that the monastery there built was erected by his "provision." William, the second Earl of Surrey, gave numerous lands in Acre and other places, among which were "two orchards and all the plough land from those orchards to the castle of Acre upon which the monks had founded their new church, because that which they previously had was too small and inconvenient." The tithes of a considerable number of churches were settled upon the priory by Ebrard, Bishop of Norwich, about 1140; charters of freedom from toll were granted by the kings Henry I. and Henry II.; and other benefactions, too numerous to mention, were conferred by different individuals and at different periods of time. About 1283 the prior was found to hold, according to the statement of Blomfield, 460 acres of arable land, twenty of pasture, ten of meadow, five water-mills, with the liberty of fishing therein, in pure alms; and divers other lands in the town, held by thirty-six tenants, a court-baron, two folds, two free boars, and two bulls; forming altogether a tolerably ample endowment for a religious house founded

as a *cell*. Indeed, cell though it was, it was considered of sufficient importance to have other houses subordinate to itself as cells. These were—Mundham in Suffolk, Broxholm, South Reinham, and Slevesholm in Norfolk. An hospital of lepers at Rachnesse in Southacre, and the priory of Crabhouse, or Wigenhall, for Austin nuns, in Norfolk, were also subordinate to Castleacre. Owing doubtless to its thus becoming a distinguished establishment, it was raised to the rank of an independent house in the forty-seventh year of the reign of Edward III.

There do not appear to be any circumstances of particular interest in the history of Castleacre Priory. It was surrendered to Henry VIII. at the dissolution of monasteries, on the 22nd of November, 1533, Thomas Malling, the prior, and several of his monks, signing the deed of surrender, which was made, it states, on account of "certain causes them their souls and consciences especially moving." The clear revenues were then 306*l.* 11*s.* 4¾*d.* The priory was granted soon after by the king to Thomas, Duke of Norfolk, whose descendants alienated the site to Thomas Gresham, Esq., during the reign of Elizabeth, and from that gentleman the rights were conveyed to Thomas Cecil, afterwards Earl of Exeter. His son, William, Earl of Exeter, sold the priory to Sir Edward Coke, whose descendant, the present Earl of Leicester (late Mr. Coke), now possesses the estate.

The best description of the priory as it was is given in Blomfield's work, which we therefore quote. "The site of the priory church lies west of the castle, was a venerable large Gothic pile of freestone, flint, &c., and built in a cathedral or conventual manner. Great part of the front or west end of it is still remaining, where the principal entrance was through a great arch, over which was a stately window. On each side of the great door were doors to enter into the north and south aisles. Under the tower was an arch which, as the grand door, served for an entrance into the nave or body. At the north and south ends of this front or west end stood two towers supported by strong arches and pillars. The nave or body had twelve great pillars, making seven arches on each side, the lowest joining to the towers. On the east end of the nave stood the grand tower, supported by four great pillars, through which was the entrance into the choir. On the south and north sides of this tower were two cross aisles or transepts; and at the end of the north transept there seems to have been a chapel or vestiary. The choir was of equal breadth with the nave and aisles, but much shorter, and at the east end it was in form of a chapel; and here stood the high altar, as I take it. The cloister was on the south side of the church, and had an entrance into it at the west end of the south aisle near to the tower, and another at the east end of the said aisle near the grand tower. The chapter-house seems to have joined the east side of the cloister, and the dormitory to have been over the west part of the cloister. West of the cloister and adjoining was the prior's apartment, now converted into a farm-house. In a large room above stairs, called now the prior's dining-room, is a curious bow-window of stone, consisting of nine panels. In the first were the arms of the priory painted on glass [and in the others the arms of the Earls of Warren and Arundel, of Mowbray, Duke of Norfolk, and of England and France. From an inscription on one of the windows it] appears that this window was built by John Winchelsey, prior in the reign of Henry VII. or Henry VIII. Afterwards it might be converted into a dining-room; but that it was originally a large chapel, and this room was only the west end of it, is apparent. It extended to the south tower of the church, where, at the east end of it, is a large window, as in a chapel, and a step or ascent here, as to an altar; and on the south wall near to this ascent is an arched carved seat of stone rising in form of a pyramid, with the shield of the Earl Warren alone, which testifies it to be an antique pile built in their time, before the patronage of the priory came to the earls of Arundel; and at the north-east corner, near to the altar-piece, is a door-place with a stone arch, and here was a stone staircase which led down into the cloister. In another room was, a few years past, in a window, the broken portraiture of one of the earls of Arundel in armour, with a broadsword in his hand. The grand entrance was north of the priory church, where is now standing a large and stately gatehouse of freestone. The whole site was enclosed with a lofty stone wall, good part of which is still standing." So far Blomfield's description in 1775. Since then various dilapidations have taken place; but the outline of the ruins as he describes them are yet traceable. The extent of ground occupied by the priory within the wall was no less than twenty-nine acres. The chief remains are now some large columns of the nave (only one in a perfect state), the walls of the transepts, considerable portions of the conventual buildings to the south of the priory church, the prior's house adjacent to the south-west angle of the church, the barn of the monastery, and the porter's lodge. The great object of interest in the remains is of course the beautiful western front. This is a fine specimen of enriched Norman architecture. The large window over the central doorway forms, however, an exception to the general style of the front, being of what is called the perpendicular architecture: it is much mutilated. The general effect of the ruins is exceedingly picturesque and impressive: indeed, taken altogether, there are few finer things of the kind in Great Britain than Castleacre Priory.

RUSSIAN TRAVELS IN SEARCH OF A NATIONAL RELIGION.

That individuals should have their religion to choose, from the non-possession of any, is unfortunately too common to be remarkable; but that a populous nation should seek this desideratum by sending forth their authorised emissaries *in search of a religion*, is one of the curiosities of Russian history.

The tutelary deities of Russia were arrayed in all those terrible and savage qualities so congenial to the fierce and uncultivated minds of a people deeply sunk in the slough of barbarity. The rites which superstitious ignorance performed in honour of these idols were impious in the extreme. Nothing was supposed to delight their gods but scenes of madness, cruelty, and licentiousness; whilst their wrath could only be appeased by human sacrifices.

In this distracted state of popular delusion—in this fulness of ignorance, which darkened all the region of Russia—by the interposition of Divine Providence the sun of Christianity arose. The first ray of evangelical light seemed to beam on the Russians about the year 870, by the instrumentality of Oskold, Prince of Kief, during the reign of Rurik, the founder of the Russian monarchy. In one of those sudden excursions of piratical adventure which perhaps had before alarmed the timorous Greeks, the enterprising Oskold marked out their magnificent city of Constantinople as the grand object of his ambition. This daring attempt was made with two hundred boats, or monoxyla, as they were called, and, without the least opposition, they passed the Thracian Bosphorus, and succeeded in occupying the port of Constantinople. The Greek emperor, Michael the Third, was absent, having left his capital with the vain hope of chastising the Saracens. On the first news of these unwelcome and dangerous visitors, he returned with his army to revive the fainting courage of his capital. In effecting a landing at the palace stairs, the emperor, from his vicinity to the invading Russians, had to encounter numerous difficulties. This imbecile sovereign of the Greeks, instead of securing the relief of his people by a determined spirit of zeal and

patriotism, directed his agitated steps to a church of the Virgin Mary, where, with the patriarch, he passed the whole night in prayer. By the injunctions of the patriarch, the garment of the Virgin Mary, a most precious relic, was taken from the sanctuary and dipped into the sea. A tempest released them from their present fears by compelling the Russians to a precipitate retreat, which was attributed by their blind credulity to the influence of the "mother of God." Oskold, however, soon returned, and succeeded in his enterprise. After enjoying the glory of humbling the Greek pride, he demanded a peace, which was readily granted by their fears. After the terms of the treaty had been adjusted, Oskold expressed a wish to receive the sacred waters of baptism, and the august ceremony took place accordingly.

Under the auspices of Oskold, a Greek bishop, with the title of metropolitan, is supposed for the first time to have administered the sacrament and performed his priestly functions in the church of Kief. But the salutary vegetation of the Gospel was blighted by the ungenial touch of these barbarians, since, after the death of Oskold, this short glimpse of holy light was soon involved in a cloud of ignorance so thick and heavy as to obscure almost all traces of their Christian conversion. This darkness began to disappear when the Russian throne was mounted by the Princess Olga, a woman pre-eminently gifted with those qualifications which imprint the duty of obedience on minds the least tinctured with the virtues of civilization. Although gross idolatry and barbarism overspread her country, yet the precepts and example of the Greek missionaries transplanted by Oskold made an impression on her heart too deep to be easily effaced. Accordingly, moved by the wish of embracing Christianity in the most august manner, or by the less spiritual desire of extending the circulation of her trade, or the very wise one of civilising her people, she sailed from Kief to Constantinople.

The emperor Constantine Porphyrogenitus welcomed her arrival with all the honours appropriate to her rank, and with all the forms and ceremonies which could flatter her female vanity and display the transient greatness of his luxury and splendour. The emperor himself led her to the baptismal font, where she received the name, ever venerated in after-time, of the Empress Helena.

On her return to Kief and Novgorod, she pertinaciously adhered to her new religion, notwithstanding the obstacles presented by her own family and the impenetrable barbarity of her subjects. But this great princess, deservedly so called (for in this barbarous age she constructed towns and villages, formed bridges and roads for the benefit of traffic, and established institutions of general utility), had soon to feel her weakness in so gigantic a task as that of indoctrinating her rugged barbarians. She was doomed sensibly to feel the feebleness of her power in advanced life, and the obstinacy of antient prejudice, when she aimed with her utmost energy to wean her son and the whole nation from their attachment to the gods of their fathers.

Proud and sanguinary, and strangers to all those pursuits which give birth to acts of humanity and justice, her people scorned all the mild inculcations of the new faith. In answer to her exhortations, her son Sviatoslaf insultingly demanded whether she wished him to become an object of contempt and derision to his companions. From the temper of this interrogatory, it requires no great depth of sagacity to have foreseen that the Christian religion would soon shrink into insignificance and obscurity on the death of Olga. Indeed, so rapid was its decline, that the churches erected by the fervent zeal of this princess could scarcely preserve it from total extinction.

It was not till about the year 986, when Vladimir the First had attained the maturity of his fame, that paganism was to receive its death-blow in the Russian territories on the revival and firm establishment of Christianity. The military renown, the increasing wealth, the unrelaxing firmness, the extensive authority of Vladimir, now began to command the fears and to invite the attention of the neighbouring potentates. By gifts they courted his esteem, by embassies they solicited his conversion to their respective creeds. Nearly at the same time, it is said, were presented to him deputies from the Pope and from the Jews established among the Kozares. But all their prospects of success were darkened by the mission and lively eloquence of a Greek metropolitan. This prelate, whom the chroniclers dignify with the appellation of a philosopher, though he failed in making an absolute proselyte of his illustrious auditor, was, however, dismissed with his friendship and gifts; a happiness which the rest had sighed for in vain. Indeed, so strong was the impression made on the heart and understanding of Vladimir by the discourse of this theological advocate, that he dispatched six or ten Russians to inspect minutely the religious principles and rites of different nations; in short, to travel in search of a national religion.

These deputies in search of a national faith first directed their course to the Bulgarians (eastward of Russia), the zealous champions of the warlike prophet of Mecca. But they soon changed their abode, little moved by their veneration for the doctrines of the Koran. They afterwards visited the Latin churches of Germany, whose want of external ornament they beheld with emotions of pity and contempt. But on their arrival at Constantinople, they gazed with admiration and delight on the magnificent dome of Saint Sophia; and their attention was arrested by the pompous and alluring embellishments which adorned their altars; by the pictures of their saints and martyrs; by the rich vestments of their priests; by their worship of images and relics; and by the order of their ceremonies, where music and fragance lent their aid in the pageant. A religion, therefore, which embraced such a succession of splendid rites, was soon considered, by their uncultivated intellects, to contain the very essence of Christianity.

With minds heated and enraptured by these gaudy though perhaps not unmeaning spectacles, they hastened their return to Vladimir. To his inquiries on the events of their mission, they gave concisely their account of the Latin ceremonial; whilst they expatiated with enthusiasm on the beauties of Constantinople. We thought ourselves transported into Heaven, exclaimed they, to their attentive monarch; nor were they slow to believe that a choir of angels came down each day from the skies to join in the sacred songs and worship of the Greeks. Thus did the splendour of the Grecian ceremonies eclipse all hope of their conversion to the Latin church. When the curiosity of the Prince was satisfied, they implored his permission to be initiated into the pleasures of religious adoration at Constantinople.

No sooner had the boyars of his council perceived the effects of this recital on the mind of Vladimir, than they cried out, that the religion which could be honoured by the praises of the deputies, and embraced by the pious Olga, must be worthy of belief.

But though Vladimir listened to the voice of reason, or rather, to the dictates of his own inclinations, yet his conversion was retarded for the want of Greek priests. To demand them of the emperor, he conceived, would be a species of homage, at the very idea of which he revolted. The barbarian therefore resolved to wrench with his sword that baptism and instruction which to have possessed in a proper manner would have been thought disgraceful. This wild plan of Christianizing his country was pursued with industry and executed with spirit. An immense army, composed from the flower of his empire, soon passed the Taurican Chersonese, and marched to Theodosia, the modern Kaffa. Before this place he is said to have addressed the Almighty power, in a speech worthy of himself, his country, and his times. "O

God, enable me to overcome this city, that from hence I may transport priests and Christians into my country, into my dominions, whose piety and learning may instruct us in the true exercise of religious worship." He then attacked the city, unaided by any of those implements of assault which expedite the labours of a siege. But his slow progress, and the number of men which he lost, might have excited, in a less ignorant mind, some apprehensions that his present conduct was a direct violation of those moral and Christian duties which he so anxiously wished to discharge. After pressing the siege for six months with an ineffectual vigour, the pagan began to suspect that he had adopted an expedient by no means favourable to his present conversion. With the shame of relinquishing his enterprise, he now entertained the most serious fears that he must also renounce the pious object which induced him to undertake it. These fears, however, were at length quieted in a most auspicious manner. A letter fixed on an arrow was shot from the top of the ramparts, by which he learned that the method of subduing the city was to cut off their supply of water. Vladimir soon discovered the fountain, and cut off the pipes that conveyed the water to the besieged. The difficulties then vanished; the complaints of thirst were heard, felt, and soon remedied by a general surrender. In possession of Theodosia, he saw himself master of the whole Chersonese. By this victory his power was enlarged and his fancy gratified. But the enforcement of baptism formed not the sole object of his ambition; he aspired to mix his blood with that of the Cæsars, by a marriage with the princess Ann, sister of the reigning emperors Basil and Constantine. His pretensions were enforced by the promise of conversion, and by the threat that Constantinople might soon expect the same fate as Theodosia, should his demands be refused. After some delay, they consented to the first proposal. At the same time, therefore, and in the city of Cherson, the rites of baptism and marriage were solemnised by the Christian pontiff. Vladimir restored the city to his brothers-in-law; whilst abbots, priests, images, relics, holy books, and sacred vessels were transported into Russia as rewards of this conquest and alliance.

On his return to Kief, every indignity which could be devised by the imagination of Vladimir was offered to those idols which he had so long adored. Under the sagacious view of diminishing their estimation, and consequently of obtaining a more ready acquiescence to his devout example, Peroun, the god of thunder, and the most august of their divinities, at his despotic command was tied to the tail of a horse, and dragged through the streets of Kief; whilst twelve soldiers, during this procession, battered with clubs the golden head and silver ears of the misshapen image; after which it was thrown into the waters of the Borysthenes.

After this act of expiatory vengeance, an edict of Vladimir proclaimed to his subjects that all those who refused the rites of baptism would be considered and treated as enemies of Jesus Christ and of their prince. The moment this order was published, many thousands of Russians flocked to the rivers to receive the sacrament of baptism.

On this occasion, we hear of no martyrs for the ancient faith; no bold thinkers who durst offer their blood on the altar of the mind's freedom to receive or reject creeds; all was obedience and alacrity to adopt the religion of the sovereign. No persecutions or admonitions were necessary to strengthen the decree, since they all tacitly submitted to the truth and goodness of a doctrine which had been adopted by their monarch and his boyars. Such was the establishment of Christianity in Russia, which soon levelled with the ground the gross and incongruous edifice of pagan superstition.

Education one of the Remedies of Economical Evils.—There are no means of facilitating the transfer of labour equal to the growth of intelligence among the people. Ignorance believes itself to be fated to remain in the spot where it was born, and to follow throughout life the occupation to which it was bred: its vision is confined to a narrow circle of observation, beyond which it is afraid to move. Hence it is that thousands, who might better their condition if they would rouse themselves to make the effort, only do so when driven to it by extreme necessity. This is the case among a large class of weavers. There are multitudes whom no evidence of the decaying state of the trade will induce to quit the loom, nor will they do so until want overtakes them in its most frightful form. A man accustomed to reflect on his position, and who has read of, or noted in his experience, the many resources of which industry and ingenuity have availed themselves in similar circumstances, does not wait to be overwhelmed in the common storm, and finds, in time, a port of refuge. This is one reason why the weavers now appear, as a body, less intelligent than those of former years. The educated portion have left the trade; those among them who have not done so are either in good circumstances, or the old, to whom the idea of change comes too late. I have conversed with many of this class,—men who, having enjoyed the benefit of instruction, have appreciated its advantages, and given it to their children. Their children had not been brought up to the hand-loom.—*Mr. Hickson's Report.*

Elephant-catching.—There are several different ways of catching elephants in Ceylon; but that requiring least preparation and most dexterity is noosing them in an open forest. For this purpose, having ascertained the position of one, the hunters steal up against the wind, carrying their atmaddoos (strong ropes made of bullock's hide, with a noose at one end). Having got close to the animal's flank, they watch an opportunity, either when he starts off or attempts to turn round, of slipping the noose under a hind foot, at the same time taking a turn round a tree with the other end of the rope. Checked and tripped, the animal stumbles; and before recovering, additional hide-ropes are fixed to his other legs, which are afterwards entangled by cords made from the keetul (sugar-palm) tree, and twisted from one foot to another, in the form of a figure of eight. The elephant is then fixed to the nearest tree, and a shed erected over him, until tame ones can be procured to escort him to the stable.—*Major Forbes's Eleven Years in Ceylon.*

Labour and Capital.—It is easy to discover that the source from which capital is ultimately derived is labour. Production of necessity begins with the hands, and nothing else, of the labourer. It is sufficiently evident that without saving there could be no capital. If all labour were employed upon objects of immediate consumption, which were all immediately consumed, such as the fruit for which the savage climbs the tree, no article of capital, no article to be employed as a means to further production, would ever exist. To this end something must be produced which is not immediately consumed, which is saved and set apart for another purpose. Every article which is thus saved becomes an article of capital.—*Mill's Political Economy.*

Poetry.—The present life is not wholly prosaic, precise, tame, and finite. To the gifted eye it abounds in the poetic. The affections which spread beyond ourselves and stretch far into futurity; the workings of mighty passions, which seem to arm the soul with an almost superhuman energy; the innocent and irrepressible joy of infancy; the bloom, and buoyancy, and dazzling hopes of youth; the throbbings of the heart when it first wakes to love, and dreams of happiness too vast for earth; woman, with her beauty, and grace, and gentleness, and fulness of feeling, and depth of affection, and her blushes of purity, and the tones and looks which only a mother's heart can inspire;—these are all poetical. It is indeed good to feel that life is not wholly usurped by cares for subsistence and physical gratifications, but admits, in measures which may be indefinitely enlarged, sentiments and delights worthy of a higher being. The power of poetry to refine our views of life and happiness is more and more needed as society advances. —*Dr. Channing's Remarks on the Character and Writings of Milton.*

THE COMMON PHEASANT.

[*a*, Silver Pheasant; *b*, Gold Pheasant; *c*, Reeves's Pheasant (Symmaticus Reevesii)—males.]

In a former Number (No. 282) we have given a representation of the Horned Pheasant and an account of the principal foreign pheasants. In the present article we shall confine ourselves to the common English pheasant; but as the form of that is too well known to require a pictorial illustration, we have given a group of three of the most splendid of the foreign birds of this species.

The two first of these (natives of China) are common in almost every aviary, and there is no reason why they should not thrive well if turned out in our preserves; the second species has, we believe, been so turned out with success; the last is also found in China, but, as it would seem, on the very confines of the empire. It is very rare in Pekin. Dr. Latham's description was taken from Sir John Anstruther's drawings, and from some writing under them in the Persian language it appeared that the bird was called *Doomdurour*, or Long-tail, and it was found on the snowy mountains of Surinagur. To Mr. Reeves we are indebted for the first individual ever brought alive to Europe. It was a male, and continued to live for some time in the Garden in the Regent's Park. Tail-feathers from it were exhibited to the Society in 1831, measuring each about five feet six inches in length. A second male specimen was also sent to their menagerie by the same liberal donor in 1834. Hybrids were obtained, one of which is, we believe, still alive at the Garden, from one of these birds and the common pheasant.

The generic character of the common pheasant is as follows:—Bill of mean length, strong; upper mandible convex, naked at the base, and with the tip bent downwards. Nostrils basal, lateral, covered with a cartilaginous scale; cheeks and region of the eyes destitute of feathers, and covered with verrucose red skin. Wings short, the first quills equally narrowed towards their tips, the fourth and fifth the longest. Tail long, regularly wedge-shaped, and composed of eighteen feathers. Feet having the three anterior toes united by a membrane as far as the first joint, and the hind toe articulated upon the tarsus, which in the male birds is furnished with a horny cone-shaped sharp spur. (Gould.)

The type of this genus is generally considered to be the *Common Pheasant*, *Phasianus Colchicus*, Linn., a bird which, though not originally British, is completely naturalised in our islands, and indeed appears to adapt itself with great facility to most countries where ordinary care is taken to preserve it and the temperature is not too low for its constitution. The species is too well known to need minute description, but a summary of its habits will be interesting, particularly at this season of the year, and we shall endeavour to lay before the readers some information on these points.

Hen pheasants in this country begin to lay in April, and deposit from eight or ten to fourteen olive-brown eggs in a rough nest on the ground. Sometimes two will lay in the same nest. The young make their appearance towards the end of May or beginning of June.

Where the country is favourable, it is easy to get up a head of pheasants, with the aid of good keepers; but it is more difficult to keep them at home, for they are wandering birds, and will often leave the place where they are bred, in search of food more agreeable to them and localities more congenial to their habits. Warm covers and water are absolutely necessary; and if they are plentifully supplied with grateful food, but few of them will become vagrants. Jerusalem artichokes, potatoes, and buckwheat, as well as barley, are favourites. Small stacks of the latter grain in the straw are frequently placed about the preserves, and there the pheasants may be seen scratching at their feeding-time; but this mode of supply is objectionable, as the poacher soon finds out the several points of attraction, and avails himself of them accordingly. Mr. Yarrell states that one good mode of inducing them to stop at home is to sow, in summer, beans, peas, and buckwheat mixed together, leaving the whole crop standing on the ground. The strong and tall

stalks of the beans carry up and sustain the other two, and all three together afford, for a long time, food and cover. (*Hist. of British Birds.*) The same author tells us that at the end of autumn he has found the crops of the birds distended with acorns of so large a size that they could not have been swallowed without great difficulty. In December, 1834, we saw eight ripe acorns and a ripe hazel-nut taken out of the crop of a hen pheasant from Sussex. The acorns had begun to germinate with the heat and moisture of the crop, and they were sent up to the gardens of the Zoological Society in the Regent's Park, and there planted. For autumnal and winter home-feeding we have seen potatoes used with excellent effect, not only in keeping the birds from wandering, but in increasing their weight and fatness. Carts loaded with raw potatoes were, from time to time, driven into the covers, and the potatoes were scattered about by hand. The pheasants soon found them out, and throve accordingly, without being collected together at particular spots, as they too often are to their destruction. They are very general feeders; neither blackberries, sloes, nor haws come amiss to them, and grain, seeds, and tender leaves find their way into the pheasant's crop as well as insects. Mr. Selby observed that these birds sought after the root of the acrid bulbous crowfoot (*Ranunculus bulbosus*, *Common Buttercup*) in May and June, and a friend informed Mr. Yarrell that they also feed on the Pilewort Crowfoot (*Ranunculus ficaria*). Mr. Selby further states that the bulb of the garden tulip is an article of diet which the pheasant omits no opportunity of obtaining, and which, however deeply buried, the bird is almost certain to reach by means of its bill and feet. The size to which these birds attain when well fed is considerable. In the catalogue of Norfolk and Suffolk birds, by the Rev. Revett Sheppard and the Rev. William Whitear (*Linn. Trans.*, vol. xv.), the weight of a cock pheasant killed at Campsey Ash, where the birds were well fed with potatoes, buckwheat, and barley, is stated at four pounds and a half. "Some winters since," says Mr. Yarrell, "my friend Mr. Louis Jaquier, then of the Clarendon, produced a brace of cock pheasants which weighed together above nine pounds. The lighter bird of the two just turned the scale against four pounds and a half; the other bird took the scale down at once. The weights were accurately ascertained, in the presence of several friends, to decide a wager, of which I was myself the loser."

Among the diseases and disorders to which the pheasant, in common with other gallinaceous birds, is subject, the fatal *gapes* holds a prominent place. The cause of this disease is an intestinal worm, which adheres to the internal surface of the trachea, and causes death by suffocation, sometimes arising from inflammation of the part, and not unfrequently by actual obstruction. This *entozoon* is *Syngamus trachealis* (*Distoma lineare* of Rudolphi, *Fasciola Trachea* of Montagu), and a most curious animal it is. The bifurcation of the anterior extremity was taken by earlier observers for a double head, and thence probably came the name *Distoma* (double-mouth); but this bifid termination is in reality due to the two sexes. The female is long; and the short male is affixed to her for life by means of an integument which holds him to her, but which, if cut open, exhibits an otherwise free and distinct animal. In the museum of the Royal College of Surgeons, Nos. 199, 200, 201 (*Preparations of Natural History in Spirit*), exhibit this destructive worm. The first shows several specimens from the trachea of a chicken; the second consists of a small portion of the trachea of a bird laid open, and exhibiting one of this species which has lost its original pink colour and become blanched in the spirit; and in the third is to be seen the trachea of a partridge completely choked up by them. Mr. Selby observes that many recipes for the cure of this fatal malady (which is provincially called the *Nax* in Northumberland) have been suggested, but that none of them seem to be effectual, except the one recommended by Montagu, namely, fumigating by tobacco, found to be an infallible specific when administered with due care and attention. The mode of administering this remedy is by putting the young pheasants, turkeys, chickens, or partridges affected into a common wooden box, into which the fumes are blown by means of a tobacco-pipe. That this often succeeds is true, but we cannot confirm its infallibility in all cases: a pinch of common salt, put far back into the mouth of the patient so as to reach the upper part of the trachea, is a neater and less operose method of cure. With reference to this, it has occurred to us that we never heard of any pigeons being affected with the gapes, and the fondness of these birds for salt is well known. We have heard of a sparrow being attacked by this *entozoon*, but we did not see the case.

The assumption of the plumage of the cock pheasant by the female, when, through old age or organic defect, she is no longer capable of reproducing the species, is by no means uncommon, not more rare indeed, if so much, as it is in the peafowls. Mr. Yarrell, in his excellent 'History of British Birds,' now in course of publication, observes that these cock-plumed hens are usually called by sportsmen and gamekeepers "Mule Pheasants," a designation which he considers to be correct, since some of our dictionaries show that the term *Mule* is derived from a word which signifies barren, and such hen pheasants are incapable of producing eggs, from derangement of the generative organs; sometimes an original internal defect, sometimes from subsequent disease, and sometimes from old age. He adds that he has seen this disorganization and its effects among birds in the Gold, Silver, and Common Pheasants; in the Partridge, the Peafowl, the Common Fowl, the Crowned Pigeon, the Kingfisher, and the Common Duck; in the latter species he states that the change, in two instances, went on even to the assumption of the two curled feathers above the tail.

That hen pheasants which have begun to put on the livery of the male are not always incapable of producing eggs, is a fact for which we are indebted to Sir Philip Grey Egerton, Bart., well known for the acuteness of his observations in many departments of natural history. Sir Philip informs us that about four years ago a hen pheasant at Oulton Park, Cheshire, which had nearly assumed the plumage of the cock, laid a nest full of eggs, from which she was driven by the curiosity of persons who came to gaze at so strange a sight. She then laid another nest full of eggs, sat upon them, and hatched them; but the young all died soon after they were excluded. This is a very curious case, and seems to show that though the capacity of producing eggs still remained, the organic defect was sufficient to prevent the production of a healthy offspring.

The union between the common hen and the cock pheasant is by no means rare, as is well known to those whose homesteads border upon pheasant preserves: the produce of this union is called a *Pero*. Many of these, some of them very fine birds, have been kept together in the Gardens of the Zoological Society in the Regent's Park, but they never, as far as we have been able to learn, exhibited any inclination to breed. They are generally considered, as Mr. Yarrell observes, to be unproductive among themselves, all being half-bred; but the case is different when they are paired either with the true pheasant or the common fowl. Edward Fuller, Esq., of Carleton Hall near Saxmundham, has recorded that his gamekeeper had succeeded in rearing two birds from a barn-door hen having a cross from a pheasant, and a pheasant cock, which he presented to the Zoological Society. On the same evening when these three-quarter-bred pheasants were noticed, hybrids between the Pheasant and Common Fowl, the Common Pheasant and the Silver Pheasant, and the Common Pheasant with the Gold Phea-

sant, were placed on the Society's table for exhibition. (*Zool. Proc.*, 1836.)

DOMESTIC CHEMISTRY.—No. VIII.

SOAP.

[Continued from No. 542.]

It is well known that oils and fatty substances do not unite with water, but they enter largely into the composition of soap; and as this article is soluble in water, it becomes necessary to inquire how a soluble material is formed out of materials which are naturally insoluble.

In a recent paper on sulphate of magnesia, or Epsom salts, we stated that magnesia is almost insoluble, but that by the addition of sulphuric acid a salt is produced which is endowed with a high degree of solubility. A similar example is afforded by the addition of an alkali, such as potash or soda, to fatty substances: they undergo a remarkable change called saponification, or soap-making. The alkali first converts the fat into three peculiar acids, which unite with the alkali, whereby compounds are formed to which the general name of *soap* is applied. There are various kinds of soap known to the chemist, but the best known and most generally useful is that which we are about to describe, viz., common soap, which, being soluble in soft water, is extensively used as a detergent.

Soap was, to a certain extent, known to the ancients. Pliny speaks of it as being made of fat and wood-ashes, and refers the invention to the Gauls. In Holland's translation of Pliny the passage reads thus:—"*Sope* is an invention derived by the French for to colour the haire of the head yellow; made it is of tallow and ashes: the best of all other is that which they make of beech-wood ashes and mutton sewet; and the same after two manner of wayes; either thicke and hard, or else liquid and soft; but the one as well as the other is verie much used in Germanie, and a great deale more indeed by men than women." The practice of filtering water through the ashes of wood-fires is very old, and is still observed in most places where wood is the common fuel. The alkaline liquor, called *ley*, thus obtained, is a solution of impure potash: it acts as a detergent by combining with greasy substances and rendering them soluble; and thus the business of the laundress is often conducted without the use of soap.

America supplies large quantities of potash, in consequence of the abundance of wood in that country. The alkali is procured by burning vegetable matters to ashes by a slow fire, in a kiln or in pits: even timber, which in many parts of America is considered rather as an encumbrance to the soil than as a valuable property, is often burnt solely for the sake of its alkali. The ashes thus procured are thrown into wooden cisterns, which have a plug at the lower part of one of the sides, under a false bottom: water is then added, and some quicklime stirred in. After remaining for a few hours, the soluble parts of the ashes are dissolved; the clear liquor is drawn off; evaporated to dryness in iron pots (whence the name *pot*-ash is derived); and, lastly, fused at a red heat into compact masses constituting the potash of commerce. This substance being subjected to certain purifying processes, a salt is obtained in a round *pearly* form, to which the name *pearl*-ash has been applied.

Potash, of which we have just spoken, is one of the ingredients employed in making *soft soap*: the alkali employed for the corresponding purpose in making *hard soap* is *soda*. Most of the algæ, or sea-weeds, but especially the fuens and salsola, yield soda by burning. They are dried, and then burnt in a kiln formed of loose stones, whereby the soda, together with some earthy matter and neutral salts, fuses into a mass, in which state it is sent into the market. The sea-weed which furnishes this crude soda is called *kelp* in Scotland, *barilla* in Spain, and *varec* in France. The proprietors of the shores of the Scottish Islands and Highlands formerly derived very large revenues from kelp; but when the duty was taken off salt, crude soda was manufactured from it; and now nearly all the soda and carbonate of soda of this country are made by the decomposition of salt. We need not describe the interesting processes for procuring soda from sea-weed, because this once flourishing trade is now nearly extinct; we therefore pass on to the consideration of the employment of the alkali in making soap.

Hard soap, which is the most important kind, is, as we have said, produced by the action of soda upon fatty substances; but before the manufacture can be commenced, it is necessary to purify the crude soda. For this purpose it is pounded, and stratified with a quantity of quicklime (proportionate to the quantity of carbonic acid in the soda) in large vats furnished with false bottoms perforated with holes, and having a lateral opening beneath; so that when water is added to the vats, a strong caustic ley is obtained, clear and purified by filtering through the beds of lime. The ley being thus prepared, a quantity of tallow or oil is weighed, and put into the soap-pan or boiler: when sufficiently heated, the workman adds the ley, and stirs up the mixture. After boiling gently for four hours, the fat will have become completely saponified. The fire is then removed, and the contents of the pan left for about one hour to cool; when the spent leys, now no longer alkaline, are drawn off. Fresh ley is added, and the boiling renewed as before: this process is performed a third time in the course of one day's work. Next day the same routine is resumed with stronger leys, and so on day after day until the contents of the pan are of sufficient consistence to solidify on cooling. It is then laded into a large square vessel, composed of a number of frames superposed; so that when the soap has become hard, each layer of framework can be removed from the top downwards: the soap is then cut into cakes, by passing a piece of wire through it; and these cakes are again divided into the long pieces which are seen at the retail dealer's. In some factories, the frames are often piled up to the height of ten feet, and bound together by iron rods, forming a sort of well, capable of holding two tons of soap. The mottled or marbled appearance of some soaps is produced by introducing a little strong ley of crude soda into the nearly finished soap.

Yellow or resin soap is made in a similar manner to that just described, with the addition of a quantity of resin, which is generally added to the last charge of ley. Resin is soluble in alkaline solutions, but is not, like fat, susceptible of saponification. The quantity of resin employed is equal to about one-third or one-fourth of the tallow: it is reduced to a coarse powder, and mixed up by means of a rake with the contents of the pan. The boiling is continued with an excess of caustic ley until the resin is thoroughly incorporated with the soap paste. Palm oil is usually added to brighten the colour. Silica or flint soap, lately introduced, is formed by reducing flints to powder, and then boiling them in a strong solution of caustic soda; a compound is thus formed called silicate of soda, from ten to thirty per cent. of which is added to the pasty mass in the soap-pan. Silica soap possesses very strong detergent properties, but it is hard and somewhat gritty to the touch: it is, we believe, a patented invention.

When potash is exposed to the air it absorbs moisture, and soon becomes liquid; this is not the case with soda; and hence soda soap remains hard, and potash soap becomes soft. In this country soft soaps are made with animal or vegetable oils mixed with tallow; the potash ley is added, and the mixture is heated until it acquires a thin gluey consistency: more of the ley is added, and the boiling is continued until the mixture is thick enough for use.

The toilet-soaps sold by the perfumer are made in accordance with a large number of receipes; and each perfumer generally prides himself on some secret process which he thinks superior to all the rest. The principle, however, upon which all soaps are made will be easily gathered from the foregoing details: for hard toilet-soaps soda is the alkali employed; and potash for those that are to be soft. Tallow, hog's lard, oils of cloves, of almonds, and of palm are among the fatty substances generally used; while the pleasing odour of toilet-soaps is conferred by some of the essential oils and other perfumes. Some of those soaps which appear most beautiful to the eye possess very feeble detergent qualities; others, when carefully made from a mixture of two or three kinds of soap, are agreeable additions to the toilet. Perhaps the most celebrated fancy or toilet soap is the soap *à la rose*, which is made as follows:—Thirty pounds of olive-oil soap and twenty of good tallow soap are reduced to thin shavings by means of a plane with the under side turned up so that the soap may be moved along it. The shavings are then put into an untinned copper pan, and heated by being placed in hot water. If the soap be dry and hard, the melting must be assisted by the addition of water; but this is generally avoided by choosing fresh soaps, since those which have been long kept do not form an agreeable paste. The heat is increased as the fusion advances; and when the soap is thoroughly liquefied, an ounce and a half of vermillion in fine powder is added, and well mixed with the paste. The temperature is then lowered, and small quantities of the essences of rose, cloves, cinnamon, and bergamot are added. The soap is then cast into moulds or frames, and soon sets. Dr. Ure describes this soap, when carefully made, as being "perfect in every point of view; possessing a delicious fragrance, equally rich and agreeable; a beautiful roseate hue, and the softest detergent qualities, which keeping cannot impair. Such a soap has, in fact, been known to retain every property in perfection during four or five years."

It may be well here to explain in a few words the reason for a fact which is well known to those who have to make a frequent use of soap, viz. the difficulty of using it with hard water. Hard water is that which by contact with various mineral bodies in and on the earth, acquires such a quality as to decompose soap instead of dissolving it; and the reason is, that such water usually contains some compound of lime. Suppose, for example, it contains sulphate of lime: soap we have stated to be a compound of certain fatty substances with potash or soda; but these substances unite more readily with lime than with those alkalis; and the consequence is, that when soap is rubbed in hard water, the lime quits the sulphuric acid to unite with the fatty substance; and the potash or soda unites with the sulphuric acid thus liberated from the lime, forming a soluble sulphate of potash or soda, and an insoluble curdy matter, which is familiar to those who wash in hard water. By throwing a quantity of pearlash or soda into the hard water, the sulphuric acid unites therewith, and the lime falls down as an insoluble powder; and thus the soap is not decomposed. Hair-dressers know this by experience, and employ one or other of those alkalis. It will thus be seen why it is that the employment of soft water for all purposes of washing and cleansing is both more economical and more effective than that of hard water.

Habits of Wolves.—In well-inhabited countries, where wolves are an object of constant persecution, they never quit cover to windward; they trot along its edges until the wind of the open country comes toward them, and they can be assured by their scent that no suspicious object is in that quarter; then they advance, snuffing the coming vapours, and keep as much as possible along edges and brush-wood to avoid detection, pushing forward in a single foray to the distance of many miles. If there be several, they keep in file, and step so nearly in each other's track, that in soft ground it would seem that only one had passed. They bound across narrow roads without leaving a foot print, or follow them on the outside. These movements are seldom begun before dusk, or protracted beyond daybreak. If single, the wolf will visit outhouses, enter the farmyard, first stopping, listening, snuffing up the air, smelling the ground, and springing over the threshold without touching it. When he retreats, his head is low, turned obliquely with one ear forward, the other back, his eyes burning like flame. He trots crouching, his brush obliterating the track of his feet, till at a distance from the scene of depredation; when going more freely, he continues his route to cover, and as he enters it, first raises his tail, and flings it up in triumph. It is said that a wolf, when pressed by hunger, and roaming around farms, will utter a single howl to entice the watch-dogs in pursuit of him. If they come out, he will flee till one is sufficiently forward to be singled out, attacked, and devoured; but dogs in general are more cautious, and even hounds require to be encouraged, or they will not follow upon the scent.—*Col. H. Smith's Habits of Dogs.*

Employment of Children in Coal-Mines.—The children go down with the men usually at four o'clock in the morning, and remain in the pit between eleven and twelve hours. When they come up they are allowed to play about for a little while by their parents, but are sent early to bed that they may rise again at the same early hour the next morning. To ascertain the nature of the employment of these young children, I embraced an opportunity of visiting a pit in the neighbourhood of Newcastle. Descending a shaft six hundred feet deep, I went some distance along a subterraneous road, which, I was told, was three miles in length (the overman going before me, with a Davy lamp in one hand, and, as if to neutralise the precaution, a lighted candle in the other). To the right and left of one of these roads, or "ways," are low galleries, called "workings," in which the "hewers" are employed, in a state of almost perfect nudity (on account of the great heat), digging out the coal. To these galleries there are traps or doors, which are kept shut, to guard against the ingress or egress of inflammable air, and to prevent counter-currents disturbing the ventilation. The use of a child of six years of age is to open and shut one of these doors when the loaded corves or coal-trucks pass or repass. For this object the child is trained to sit by itself in a dark gallery for the number of hours I have described. The older boys drive horses, and load the corves, but the little children are always trap-keepers. When first taken down they have a candle given them, but, gradually getting accustomed to the gloom of the place, they learn to do without, and sit, therefore, literally in the dark the whole time of their confinement. It is impossible to imagine a more monotonous and dismal occupation for a child; and yet I was told the children were not unhappy, although it was generally admitted "they did fret a good deal at first." The truth is, that by blunting the sensibilities and deadening the faculties, the mind may be rendered callous to a lot which would otherwise be too bitter for human endurance. Poverty of the parents is not the cause of this immolation of infancy. The pit-men of the north of England collieries are a better paid class of operatives than any body of working men equally numerous. I found their average earnings to be 24*s.* a week; and when a colliery is not limited in the quantity of coal allowed to be raised (which by agreement among the coal-owners is sometimes done to keep up prices), a pit-man often earns 30*s.*, and even 40*s.* in a week. Besides this amount of money wages, he is allowed a cottage rent-free, or at a mere nominal rent of sixpence a fortnight, the cottage frequently containing four good rooms. He has also a bit of garden-ground rent-free, sufficient for the growth of his vegetables; and, moreover, another important advantage, for which he may well be envied by the London operatives,—as much coal as he wishes to burn the year round, free of charge. All I have observed, however, only strengthens my conviction that high wages and corresponding benefits are thrown away upon those who have received no moral culture and are incapable of self-guidance.—*From Mr. Hickson's Report.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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POPULAR EDUCATION IN GERMANY AND IN ENGLAND.

Study of Geography—Value and Use of Maps.

[German Itinerant Map-Seller.]

We wish we could have given an "English" itinerant map-seller in our cut, but it will be long, we fear, before such a character will be found amongst us as the representative of a class. At present a travelling dealer in maps would find small encouragement in our hamlets and villages, or even amongst the artisans of our great towns. A desire for maps must be created before the hawker will find it profitable to include them in his little stock. But why, it may be asked, should an occupation which has no existence in England afford a livelihood in Germany? It is true, that in England, there are in all parts of the country well-supplied shops which afford facilities for supplying every demand, while in Germany they may be fewer and more scattered; but this is not the reason why we have no travelling map-sellers, for books are sold to a great extent in England by itinerant traders, who could as easily supply maps—if there were a demand for them. Why there is no such demand may be easily discovered. In most of the German States the standard of popular education is much higher than in England, and hence the existence of a more elevated taste among the great body of the people in those states than in our own country. In many parts of England not one-half of the adult population can write their name; and in the last 'Report' of the Registrar-General a table is given showing that out of all the persons married in England and Wales in one year, there were 41 out of every 100 persons married who were incapable of signing their names to the document attesting their marriage. When an adult is unable to write, it may be safely assumed that the time he has spent at a school has been very brief; and generally speaking it is as safe to conclude that he is incapable of reading with pleasure and advantage to himself; and under these circumstances it is too much to expect

that he should be acquainted with the elements of any of the branches of knowledge; for reading is but the instrument of knowledge, and not knowledge itself.

In Germany teaching as an art has been carried to a much higher point than in England; and a most important department of German literature consists of treatises designed to impart to persons engaged in tuition not only the knowledge which should be conveyed to children, but the most rational manner of impressing it upon their minds. Books of this class are often written by men of the highest talent; they are founded upon a true knowledge of human nature; display a perfect acquaintance with the operation of the mental faculties in children; and greatly facilitate the progress of instruction. Popular education on a right basis has perhaps made greater advances in Prussia than in any other part of Germany; and it has been the peculiar care of the Prussian government to introduce improvements from time to time, and thus by degrees to elevate the standard of education to its present scale. "Reading and writing, which formerly constituted the greatest part of instruction, are at present only considered as parts of the study of the *native language*. The casting of a few simple accounts, which forty years ago was thought the height of erudition to be obtained in elementary schools, has been pursued to *mathematics*. Under the general name of *knowledge of the external world* are comprehended the first elements of geography, history, natural history, and natural philosophy: none of these objects formerly were brought before children in these schools, except in a few disjointed notices in the course of reading-books. A new subject has lately been added to this list, namely, *drawing*. The instruction in *religion* and *singing* has much increased in intrinsic value, and is likewise carried to a greater extent."*

The third subject of instruction in the Prussian elementary schools, which comprises a knowledge of the external world, includes geography. The course commences by making impressions on the *senses* of a child: *things* are taught, and not *words* merely. Correct ideas are imparted to the child of the objects which exist around him—plants, animals, and inanimate objects; the natural features of the neighbourhood—hills, valleys, and rivers, the teacher taking the children out with him and directing their attention to each class of objects, mingling with his observations on the uses of plants, the habits of animals, &c., such mental instruction as the objects may suggest. The next step is to aid the pupil in acquiring an accurate notion of the country in which he lives, beginning with his immediate neighbourhood, the district in which it is situated, the province to which it belongs, and afterwards passing to the country as a whole. Mr. Wittich's paper contains a summary of the instruction which the whole course affords, namely:—"1, a knowledge of spaces and distances, with the inequalities of the surface occurring in them; 2, a knowledge of rocks, kinds of earth, and everything that constitutes its soil and contributes to its fertility, as climate, exposure to certain points of the compass, &c.; 3, a knowledge of the cultivated grains and plants, and also of those in a wild state which occur most frequently or have some use in domestic economy; 4, a similar knowledge of domestic and wild animals; 5, a knowledge of the inhabitants, their trades and occupations, their intercourse and religious creed; 6, a knowledge of the present political institutions and of the most remarkable historical events. Every section, therefore, contains the geography, mineralogy, botany, zoology, agriculture, technology, statistics, and history of that portion of their own country which it was the object to make known to the children."

If we compare an English village day-school with one of the Prussian elementary schools, we at once perceive the immense superiority of the latter. In the former scarcely any attempt is made to direct the attention of the children to the utility, beauty, or grandeur of external objects, and almost as little is done towards expanding their ideas or elevating their taste. Need we wonder if in after-life the parish becomes their little world, and that they are incapable of carrying their ideas beyond its limits. We now see that it is the more extensive diffusion of intelligence amongst the great body of the people which renders the occupation of the itinerant map-seller a profitable one in Germany.

It is much to be regretted that a knowledge of the principal facts in geography especially should be confined to a comparatively small number of persons in England. The native of central Germany lives several hundred miles distant from the ocean, while even the most inland parts of our island are at no great distance from the coast, from which ships are constantly sailing to every part of the globe. One would expect to find geography a subject of universal interest in a country which has been foremost in the work of discovery and colonization, and whose influence is felt over such a vast extent of the earth's surface,—but unhappily it is far otherwise. Mr. Hickson states, in his Report 'On the Condition of the Hand-loom Weavers,' that it is partly owing to the want of information concerning the great fields of enterprise in different parts of the world that men endure severe distress at home, and are incapable of appreciating the more hopeful prospects which present themselves in other countries under the British dominion. But even if these stimuli to the cultivation of geography as a branch of popular education had no existence, it is a science to which attention should be devoted for the sake of the varied and enlarged ideas which it unfolds; and there seems no reason why its most striking and useful parts should not be taught in every village school.

One thing is indispensable to the study of geography, and that is good maps. They teach *things*. "Words," says Mr. Greenough, in his last annual address to the Geographical Society of London, "words following words in long succession, however ably selected those words may be, can never convey so distinct an idea of the visible forms of the earth as the first glance of a good map. Of all contrivances hitherto devised for the benefit of geography, this is the most effective. In the extent and variety of its resources, in rapidity of utterance, in the copiousness and completeness of the information it communicates, in precision, conciseness, perspicuity, in the hold it has upon the memory, in vividness of imagery and power of expression, in convenience of reference, in portability, in the happy combination of so many and such useful qualities a map has no rival." We hope to see the time when a demand will arise for a series of maps, each exhibiting some distinct feature of the same portion of the earth. For example, our own island might be represented, first, with a bare coast outline and the courses of the rivers; secondly, another map with the high ground and the rivers also; next, a map of roads with all the great towns indicated and all the seats of manufacturing industry; and other maps might be suggested.* In consequence of the costliness of maps, the demand for them is much less active than it would otherwise be, and consequently it does not represent the extent of the latent desire which exists for such things. The application of the process of colour-printing to maps will, however, lessen the cost of production without impairing their beauty and clearness. In the 'Illuminated Maps,' the extent and configuration of each country are rendered palpable to the eye by the distinctness and uniformity of the colouring, and as the mountains may be defined in white tints, they can be accurately laid down without interfering with the names of places which lie at their base or are

* 'On the Former and Present Condition of the Elementary Schools in Prussia.' By W. Wittich, Esq. First Publication of the Central Society of Education, London, 1837.

* See a valuable paper on the 'Study of Geography,' in No. 13, 'Journal of Education.'

situated upon their slopes, an advantage of great value where the maps are on a small scale. The adaptation of the process to the production of a greater variety of cheap school maps will, it may be hoped, both encourage and supply a demand for such articles, and contribute to extend the study of geography and to facilitate its introduction as a department of popular education.

We will conclude this long notice with an extract from a valuable little work by a lady who has exerted herself with much zeal to promote the practice of an enlightened system of education. Writing on the subject of geography, she shows how a *commencement* may be made in learning the *use* of a map:* "Ask the steward to lend you the farm map: all the fields and cottages around the school are marked out on it; so are the orchards, the Cot field, the Wetcott, and the higher and lower Burn side. Now after they have made out and can tell you the direction in which all these places lie, the shape, and, as near as they can guess, the size of the fields and orchards, do you take this map and lay it on the table, and allow the elder boys to look at it with you. They will themselves find out the different hamlets, which are all marked on the map, as well as every nook and corner they know so well. Now, after they have looked over this map, they will have some notion of what a map means; but they will not at once take in what is meant by a map of the world. The view from Manor Hall knoll appears to them to take in the whole world. I advise you to take another evening's walk to this high spot, and tell them to look to the north, and fancy that if they set out to travel, they would travel on, days and weeks, and get on to very cold countries and even to frozen seas. Then, turning south, talk of countries far far away in that direction, where the sun shines almost right over their heads. If you look north-west, you can tell them it was in that direction the Thompsons sailed when they went off to Canada, across the seas. If you look south-east, you can say, 'Poor Richard James sailed off that way when he was transported last summer for stealing Farmer Wilson's sheep.' By degrees they will take in that there are lands and seas stretching out in all directions to greater distances than they can easily fancy."

DOMESTIC CHEMISTRY.—No. IX.

A CUP OF TEA.

THERE are perhaps few domestic subjects which require more the enlightening aid of a little chemistry, than the art of preparing a "good cup of tea." It is curious to remark how much diversity of opinion exists on this subject among housekeepers; but as it rarely happens that the same results are obtained by diverse means, so the reader will not have failed to notice among his visits to tea-parties, the very different qualities of the beverage offered to him. As prepared by one hostess, his cup of tea revives, enlivens, and exhilarates; as prepared by another, it is mawkish and insipid, and produces no effect beyond that of quenching thirst; and yet in both cases the same quality and quantity of tea may have been employed, although the resulting beverages are so different.

In order to do justice to what we may truly call "every body's subject," let us inquire first into the chemical nature of tea, and secondly into the science of the tea-pot.

The terms "astringent" and "aromatic" are applied to two very important vegetable principles, which frequently confer wholesomeness upon our food, and mark it with certain distinguishing peculiarities. It is easier to appreciate the quality of astringency than to express it in words; it is more or less pleasant according as it is more or less intense, or qualified by the presence of substances which impart sweetness, acidity, or aroma. Many of our common fruits are slightly astringent, but the most powerful example of an astringent substance in general use is tea. Astringents are frequently given in medicine as tonics; these act by restoring or strengthening the impaired powers of the muscular fibre, imparting what is called *tone* to the system. The chemist recognises astringents by two marked and infallible characters: first, they form insoluble compounds with animal jelly; second, they blacken the salts of iron. These effects result from the presence of a substance called *tannin*, which for the most part confers astringent properties upon all vegetables in which it is found:—leather is formed by the tannin of the oak-bark uniting with the gelatin of the fresh animal skin; and black writing-ink results from the union of sulphate of iron with the tannin or tannic acid of gall-nuts. The reader may satisfy himself of the presence of tannin in tea, by adding a little solution of isinglass to an infusion of tea; a tawny precipitate will be formed, constituting in fact a species of leather. If he add a solution of sulphate of iron to the infusion of tea, he will form a sort of ink.

Besides the tannin, to which tea owes its astringency, this plant also contains extract, resin, essential oil or aroma, and lignin or woody fibre. Of these it will be sufficient here to speak of extract and aroma.

The term "extract" is somewhat vague and unsatisfactory: it is supposed to be a nutritive substance generally associated with sugar, gum, starch, and other soluble substances: indeed, the term "extractive," or "extract," which was once supposed to be a basis common to all vegetables, is now applied to all the soluble matters procured from vegetables reduced by evaporation to a pasty or solid mass. Extracts, therefore, are as various in their properties as the plants which produce them. The extract of tea includes a peculiar bitter substance or principle called *thein;* respecting the separate existence of which, however, there are yet doubts in the minds of chemists. With regard to the common mode of producing the extract from the tea, Professor Brande observes, "When tea-leaves have been exhausted by water repeatedly affused, alcohol is still capable of extracting a considerable quantity of soluble matter. The alcoholic extract, infused in boiling water, furnishes a liquid which smells and tastes strongly of tea, and which, were it not for the expense of the solvent, and the trouble attending its separation, might perhaps be profitably employed."

The aromatic or odorous principle is in most vegetables dependent on a volatile oil, which can be separated by distillation. The vegetable essential oils may not perhaps be called nutritive, but they are wholesome and agreeable on account of their stimulating properties. They have for the most part a powerful odour, and this in a most remarkable manner, not well understood, influences the taste of the substances with which they are combined. The taste of cinnamon depends upon an essential oil contained in it: if the nostrils be carefully closed, and a bit of cinnamon be chewed, it will have no more taste than a piece of dry deal; and by adopting similar means the flavour of tea is entirely lost. Chemical analysis has failed to detect the principle in tea to which its exciting property is due; but until the existence of the principle called *thein* is fully established, it will not be unsafe to suppose that the odorous principle is most likely to be concerned in it.

There is not much chemical difference between black and green teas; the former contains probably more extractive and less tannin than the latter. It has been stated that the different kinds of tea are all gathered from the same species of the tea-plant; and that various qualities are conferred upon them by different modes of preparation. (See 'Penny Mag.,' vol. ix., p. 75; and for further particulars respecting the natural and commercial history of the tea-plant, vol. i., p. 33, and vol. iv., p.

* 'Letters on Education,' by Mrs. Tuckfield. Let. viii., 'On the first Use of a Map of the World.'

445.) Tea is the subject of extensive adulteration; black tea is imitated by sloe, ash, and elder leaves, rolled and twisted, and then dyed with logwood or some salt of iron. This spurious tea is not, perhaps, absolutely injurious to health: but the colouring material for imitating green tea is exceedingly dangerous; verdigris, or carbonate of copper, is the material employed, and this is a deadly poison.

With respect to the art of making tea in perfection, three things are absolutely necessary: first, good tea is sufficient quantity; second, a tea-pot made of a bright metal kept clean and well polished; third, boiling water; and by this we do not mean water that has boiled, but water that is actually boiling at the time of the affusion. We may pass over the first condition with a single remark—that in proportion as the other two conditions are carefully attended to, the quantity of the tea may be lessened without deteriorating the strength of the infusion. Our notice of the other two conditions will lead us into a few details of some interesting properties of heat.

There are many striking analogies between heat and light: they usually accompany each other, and for the most part proceed from similar sources. The intensity of the one also greatly depends upon that of the other; and they are both capable of being reflected, refracted, &c. Heat, however, is distinguished by some properties which do not pertain so strictly to light: not only does it pass from one body to another at a distance from it, by radiation, in the manner of light; but it also passes from one body to an adjoining one by the process of conduction. When two bodies of different temperatures are placed in contact, heat is conducted into the colder body, and it becomes heated; while the hotter body cools, and in a short time the temperature of both becomes the same. They do not, however, continue to be hot, unless fresh accessions of heat be communicated to them from some independent source: in a short time they both cool down to the temperature of the surrounding air. This is the general tendency of all heated bodies: the heat is liberated from them either by radiation or conduction; but the time occupied in thus cooling down is very different in different circumstances, according to the substance and texture of the heated body. Heat is conducted with great facility by dense and heavy bodies: gold and silver, for example, conduct it readily; while charcoal and wood conduct badly. When therefore we pour boiling water into a metal tea-pot, the vessel becomes exceedingly hot; so much so, that were the handle made of the same material as the vessel, we should be unable to hold it: we see therefore the reason why the handle is usually made of some slow-conducting material. When a silver tea-pot has also a silver handle, it is separated from the vessel at the points of union by two pieces of bone or ivory, which conduct heat so badly, that although the vessel itself is of the temperature of boiling water, yet the handle remains cool.

Heat is absorbed by dark porous bodies, and reflected by such as are smooth and bright. If we place some grease behind two pieces of metal, of which the opposite sides are the one bright and highly polished, and the other coated with lamp-black, and expose these two surfaces to the same degree of radiant heat, we shall find the heat will be so much absorbed by the black surface as to melt the grease behind it; whereas the heat will be reflected from the light surface, and the grease will remain unmelted. Now it is a remarkable fact, that the powers of absorbing and radiating heat are in the same substance exactly equal: those bodies which absorb heat readily are also active in discharging it; while those which are slow in absorbing, are also slow in radiating.

The reader will see how closely these details refer to the philosophy of a tea-pot, by attending to the following experiment of Sir John Leslie, to whom our knowledge of radiant heat is under so many obligations. He constructed a canister of tinned iron in the form of a cube; covered its sides with different substances, whose radiating power was to be ascertained; and then filled it with boiling water. The canister was placed opposite to a concave mirror, in the focus of which was placed a delicate thermometer. The hot water of course brought the four surfaces of the cube to the same temperature; and these being in turns presented to the mirror, the effect produced by each on the thermometer measured its radiating power. Taking lamp-black as the greatest radiator, and calling its radiating power one hundred, he found paper to be ninety-eight; resin, ninety-six; crown-glass, ninety; isinglass, seventy-five; tarnished lead, forty-five; mercury, twenty; clean lead, nineteen; polished tin, fifteen; and silver, twelve. Now when we state that the virtues of tea cannot be extracted unless by boiling water, and that time is required for the extraction, the above details will sufficiently show how necessary it is to make tea in a vessel which retains its heat. A tea-pot made of a dark glazed earthenware discharges the heat of boiling water with great rapidity, so that the temperature soon falls below that point necessary for making the infusion; whereas a silver tea-pot long retains the heat, completely extracts the virtues of the tea, and ultimately repays its original high cost. Next to silver, German silver (as it is called, although it contains not a particle of silver) is best adapted to the purpose. Britannia metal is also good; in short, the chief desideratum is a metal tea-pot kept bright; and it will be found that the finer the polish the better will be its action.

The solvent properties of water are greatly diminished by solid substances suspended in it, such as several compounds of lime, &c., which exist in hard water. These are not removed by boiling; but their injurious action may be removed by adding a minute quantity of carbonate of soda to the water or to the tea before affusion. Persons who reside in places where soft water cannot be procured, should adopt this method whether in brewing tea or beer.

We may further remark that the practice of placing a metallic tea-pot before the fire while the infusion is going on, in order to keep it warm, is bad: the metal absorbs no heat, but on the contrary, is actually cooled by the current of air which passes to the fire.

HORSE ARMOURY IN THE TOWER.—XIV.

Sir Horace Vere, 1606.

[Continued from No. 548.]

Having already given an account of the fashion of arms and armour during the reigns of Elizabeth and James, we may now bestow more attention on the characters of the personages who are represented as wearing the military costume of those periods. The first we meet with after James I. is Sir Horace Vere, habited in a plain suit of armour, of about the date of 1606. Sir Horace Vere, the brother of the more celebrated Sir Francis Vere, was born in 1565, at Kirby Hall, in the county of Essex. At the age of twenty years he accompanied his brother to the Low Countries, which at that time might with propriety be called a school for the education of all cavaliers who wished to see service; and there he greatly distinguished himself by his valour and judgment. He was present at the battle of Nieuport, in 1660; and greatly assisted his brother during the celebrated siege of Ostend, in defending the city from the attacks of the enemy, and in conducting the sorties by which their opponent was so continually annoyed. He afterwards commanded the auxiliary troops sent by James I. to the succour of the Elector Palatine; but in consequence of the inferiority of his army in number, and the want of co-operation with the troops of the Elector, he was unable effectually to assist him. It cannot be said, however, that he injured his fame by the expedition; for though

[Sir Horace Vere.]

he did not return loaded with laurels as a conqueror, he had increased his reputation as a commander by his conduct throughout the campaign, and principally by an admirable retreat, effected by his judgment and coolness, from the vigorous attack of the celebrated Spinola, who, with a much larger force, pressed rapidly upon him, and scarcely left him the means of saving himself. He, however, effected a retreat without loss, and with such prudence and judgment as to acquire for himself nearly as much renown as a victory would have procured him. When Charles I. succeeded to the throne, Sir Horace Vere was raised to the peerage under the title of Baron Tilbury. After this period he does not appear to have been much employed, and he died, May 2nd, 1635. His lady, distinguished as much for her piety as for her attainments and natural good sense, was chosen by the parliament to take charge of the youngest children of Charles I. The armour of this figure is very plain, with no ornaments, but remarkable as covering the whole person, a practice much discountenanced at that time.

The figure by the side of Sir H. Vere is marked in the catalogue as Thomas Howard, Earl of Arundel. In 1608 (the supposed date of the armour) he must have been (according to Sir Edward Walker) about twenty-two years of age, at which period of his life his favourite amusements were of an athletic and warlike character, such as tilting, running at the ring, &c. The date of his birth is uncertain; but Sir E. Walker says that he was seventeen years old when Queen Elizabeth died, which would fix it to the year 1586. The early part of his life was spent in retirement suited to the diminished resources of his family; but in 1603, soon after James's accession, he was restored to such honours as he had lost by his father's attainder, as well as to the earldom of Surrey, and to most of the baronies which had been forfeited by the attainder of his grandfather, Thomas, fourth duke of Norfolk. Soon after he came of age, he married Alathea, third daughter and coheir of Gilbert Talbot, Earl of Shrewsbury, a match of great advantage; for her two elder sisters, the Countesses of Pembroke and Kent, dying childless, the greatest part of her father's noble revenues in the end devolved on her. In 1607 he was sworn of the privy council, and soon after took his departure for France and Italy, where he imbibed that taste for the fine arts which became the ruling passion of his heart, and led to the formation of one of the most splendid collections of statues, paintings, and objects of *virtù* ever formed by a private individual. He remained abroad till the year 1611, and on his return was chosen a knight of the Garter.

Unable to endure the coarseness of James's manners, and with too high a sense of his own honour and the honour of his family to be corrupted by the favourites of the court, he kept aloof from political affairs, and was therefore no otherwise publicly employed than in the reception of ambassadors, and other dignified ceremonies which suited his rank and disposition. A circumstance recorded by historians will show what an exact idea he had of propriety in these matters, and of the respect due to the king his master. We give it in the words of Lodge: "Being appointed in the year 1620 to visit the Marquis de Cadenet, the French ambassador, at Gravesend, the Frenchman, on the Earl's arrival and departure, advanced no farther than the head of the staircase; the Earl therefore, who was to conduct him the next morning to London, would then meet him only in the street; and, on their arrival at Somerset House, would go no farther than the foot of the stairs, telling the ambassador that his gentlemen would show him to his lodgings. The king, who, though without dignity, was not wanting in pride, approved of the Earl's conduct, and the ambassador apologised."

The king, on the removal of Bacon in 1621, nominated him a commissioner for holding the great seal, and on the 29th of August, in the same year, appointed (or rather, restored) him to the place of Earl Marshal of England.

He was continued in the office of Earl Marshal by Charles I., by whom for some time he was treated with great favour, but the Earl's eldest son having privately married the Lady Elizabeth Stuart, sister of the Duke of Lennox, and related to Charles, who had designed to marry her to the Lord Lorne, heir to the Earl of Argyll, the king was greatly offended, and committed the Earl to the Tower, from whence he was only released, after an imprisonment of some months, at the instance of the parliament, whose repeated remonstrances at length compelled Charles to submit.

After the assassination of the Duke of Buckingham, with whom he had never been friends, he came again to court, and soon acquired a considerable share of favour and confidence. In 1633 he attended the king at his coronation in Scotland; and in the same year was deputed ambassador extraordinary to the States-General, and was made chief-justice of the Forests north of Trent. In 1636 he spent nine months in Germany on a diplomatic mission, and during that time expended upwards of 40,000*l*. in making additions to his library and cabinet.

After this he was employed in various offices connected with the court, and in 1641 presented a petition, supported by another from several peers of great worth and power, beseeching the king to restore him to the dukedom. Charles, however, for some unknown reasons, would favour him no further than by the grant of a patent creating him Earl of Norfolk. Soon after this he quitted England for the Continent, and after wandering slowly over most parts of France and Italy, admiring the many objects of art and antiquity preserved in the places he visited, and making many additions to his own collection, he at last settled at Padua, where he died, October 4, 1646.

Though not a man of warm passions, his friendships were steady, and his enmities, where they existed, honest and avowed. His whole life was governed by a high sense of honour, and though proud among his equals, towards his inferiors he was familiar and affable. "It cannot be denied," says Clarendon, "that he had in his person, in his aspect, and countenance, the appearance of a great man, which he preserved in his gait and motion. He wore and affected a habit very different from that of the time, such as men had only beheld in the pictures of the most considerable men, all which drew the eyes of most, and the reverence of many, towards him, as the image and representative of the primitive nobility and native gravity of the nobles when they had been most venerable; but this was only his outside, his nature and true humour being much disposed to levity." With respect to his dress and bearing, Hay, Earl of Carlisle, is stated to have once remarked, "Here comes the Earl of Arundel, in his plain stuff and trunk hose, and his beard in his teeth, that looks more like a nobleman than any of us."

ON TELEGRAPHIC COMMUNICATIONS.

[Continued from No. 505.]

Telescopic observation of signs exhibited at a distance being totally unavailable in foggy weather, or in the night, unless powerful lights be attached to the moving parts of the telegraph, many other means have been proposed for obtaining the same end, among which are *sound*, *pressure of air*, *pressure of water*, and *electrical agency*.

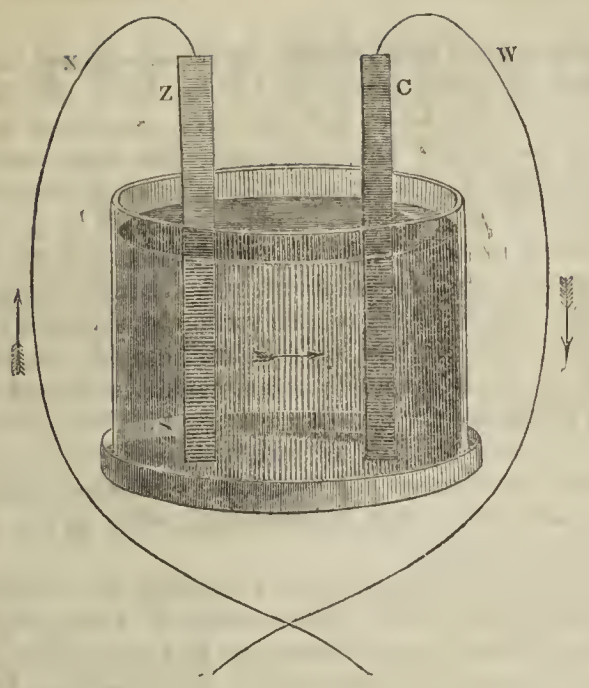
In 1828 M. Sudre proposed to the Academy of Sciences at Paris the employment of an instrument to be called the *telephony*, or musical telegraph. This was a powerful kind of trumpet or horn, capable of being heard two or three miles distant. The seven notes of the octave were to represent certain letters, figures, or words, as might be agreed upon; and the contrivance was proposed for adoption chiefly for military and naval operations. M. Sudre afterwards explained his plan in London. We do not know whether it has ever been acted on; but the public journals, about two years ago, spoke of a contrivance of M. Kfeniger, at Vienna, which consisted of a trumpet-tube six feet long, capable of yielding sounds which could be heard at a distance of 12,000 feet, and employed to convey military orders to different districts.

Within a few months a pneumatic telegraph has been proposed, and a model of one placed in the Polytechnic Exhibition, London. The principle on which it is proposed to act is this:—if a given quantity of air be confined in a tube, and be subjected to pressure at one end, that pressure will soon be felt at the other, however distant it may be. Consequently a tube of air is proposed to be used, at one end of which is a kind of collapsing bag, or reservoir. If various weights, numbered, for instance, from one to ten, be placed on this bag, they will cause various degrees of pressure, which will be felt at the other end of the tube, and may be there made to act upon the index of a dial-plate, so that the extent of the movement of the index shall denote the particular sign intended to be conveyed.

About fifteen years ago Mr. Vallance proposed the employment of a stream of water as a medium for telegraphic communication; and within two or three years a plan somewhat similar has been partially acted on by Mr. Whishaw. The principle employed is,—the well-known tendency of water to assume a common level. If water be contained in several channels communicating with each other, the *surface* of the water will be at an equal height in all. The proposal is therefore to have a pipe laid from station to station, filled with water, and terminated at each end by an upright pipe, partially filled with water. If a small quantity, say one cubic inch, of water, be poured in at one end, it will act on the whole length of water in the tube, and the water at both stations will soon be a little higher than it was before: by drawing off a little water at one station, an opposite effect will result. At each station-pipe a small float may swim on the surface of the water, and act on an index hand, as is done in some forms of the barometer. This is the theory of the hydraulic telegraph; but the difficulties that might occur in its extensive application we cannot discuss here.

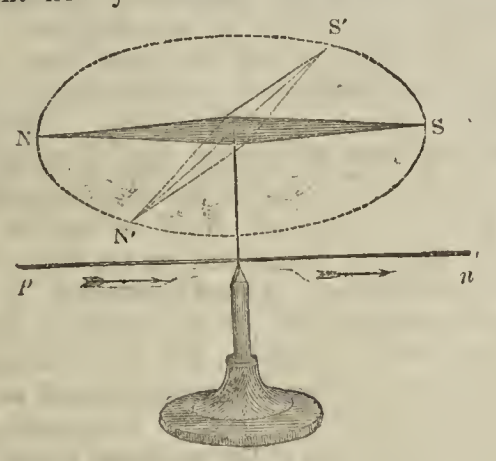
The last kind of telegraphs to which we have to allude is perhaps the most important, and is certainly the most beautiful, in a scientific point of view, of all yet proposed: we mean those worked by electrical agency. Although this is, for any useful purpose, quite a recent contrivance, yet the idea of employing common electricity as a telegraphic agent occurred long ago. Arthur Young, in his 'Travels in France,' published more than fifty years ago, after speaking of a M. Lomond, says:—"In electricity he has made a remarkable discovery. You write two or three words on a paper: he takes it with him into a room, and turns a machine enclosed in a cylindrical case, at the top of which is an electrometer, a small fine pith ball. A wire connects with a similar cylinder and electrometer in a distant apartment; and his wife, by remarking the correspondent motions of the pith balls, writes down the words they indicate, from which it appears he has formed an alphabet of motions."

But it is in our own day that the plan has been successfully adopted of applying electricity to telegraphic purposes, and in the very convenient form of galvanic electricity. The connected sciences of electricity, galvanism, and magnetism are so intricate to those who have not carefully studied them, that we cannot hope to convey much information thereon in our present narrow limits; but by attending to the following three remarks, the reader will obtain some idea of the moving-power in an electrical telegraph:—1. If a piece of copper and a piece of zinc be partially immersed in dilute sulphuric acid, a chemical action takes place; but this action is not



[This figure illustrates the *principle* of the production of a galvanic current in its simplest form. Two plates, the one of copper and the other of zinc, C, Z, dip into dilute acid. If wires connect the *dry* ends of the two plates, a current is excited in the direction of the arrows and will be continuous, whether the length of the wires be measured by inches or by miles.]

made evident, unless the upper or dry edges of the metals are connected by means of metallic wires. Directly this connection takes place, a current of the electric fluid, whatever this fluid may be, flows entirely through the wires, from plate to plate, in a continued circuit, however long the wire may be. 2. A *magnet* is a piece of steel which, either by natural or artificial means, has acquired this property—that if it be poised delicately on its centre, it will point nearly north and south. 3. If the copper,



[This figure illustrates the production of motion in a magnet by the passage of an electrical current beneath it. The magnet, N S, is poised on a pivot. A galvanic current is passing through a wire in the direction *p n*, and, by its influence, forces the magnet to assume a new direction N′ S′, by which a moving-power is attained, capable of being applied in many ways.]

zinc, and acid be in action in the way we have described, and which is called a *galvanic battery*, and if a magnet be poised at any distance from it, the following remarkable effect may be made to ensue:—cause a portion of the wire in its course from plate to plate to pass either over or under the magnet; the magnet will, through an unexplained action of the electricity passing through the wire, be made to point east and west instead of north and south.

These three truths, varied and extended in their application, are the foundation of the electrical telegraph. The simple principle by which this may be effected, we will thus explain:—suppose a person in London wish to convey a signal, that will be represented by the letter (A), to another person at Harrow, eleven miles distant. If he can lay down a copper wire from London to Harrow (which our railroads now enable us to do) and back again, he can make that wire part of a galvanic circle. At London there would be a small galvanic battery, and at Harrow a magnet, at a small distance round which the wire turns or coils itself. On connecting the wire with the plates in the battery, a current of electricity flows along one wire to Harrow, round the magnet, and back again to London; and, in so doing, *turns* the magnet partially round. Now there may be many contrivances by which the magnet should act as a lever, and, in its motion, open or shut a little door, or bring into view a piece of paper on which the letter A had been previously written; by which means the meaning represented by the symbol A would be conveyed from London to Harrow. As to the rapidity with which the circuit is made, we may remark, that Professor Wheatstone, from some delicate experiments made in 1834, is of opinion that electricity moves not *less* than 280,000 miles per second, a rapidity greater than that of light.

We have only made the supposition of *one* symbol or sign being conveyed from place to place. If we wish to convey as many signs as there are letters in the alphabet, we should have twenty-six wires extending from the galvanic battery to the distant station, where they would coil round twenty-six magnets; and these magnets would exhibit, by some mechanical contrivance, twenty-six different letters, any one of which could be acted on separately.

We have thus briefly shown how electro-magnetism *might* be made a telegraphic agent; and we have now to say that such a plan has been acted on in many different forms. Morse, in America; Gauss, Weber, and Steinheil, in Germany; Alexander, Davy, and Wheatstone, in England—have all constructed electro-magnetic telegraphs, differing in their details, but resembling in their main principles what we have just described.

Dr. Steinheil, in 1837, erected a telegraph at Munich, of which the following was the arrangement:—the galvanic apparatus was placed at the Royal Academy, and a copper wire extended from thence to the Royal Observatory at Bogenhausen, and back, a distance of 32,506 feet. The wire was stretched across the steeples of the city, and, at intermediate points, was supported by poles forty or fifty feet high, the greatest distance between the supports being about thirteen hundred feet. A second conducting-wire extended from the Royal Academy to Steinheil's house in Lerchenstrasse, and the length there and back was 5745 feet. The electricity was set in motion by one of the beautiful electro-magnetic machines which have been invented within a few years: all we can say of them here is, that they afford a more ready mode of effecting that which might be effected by the simple galvanic battery we described above. The electricity, in passing through the copper wire, turned or deflected a magnet; but the magnet, in so turning, did not exhibit a sign or letter previously written, but actually recorded its own movement, by imprinting on a piece of paper a series of dots, with some ink contained in a little cell at the end of the magnet. The paper passed slowly in front of the magnet, so that the closeness of the dots indicated the rapidity of the change of motion in the magnet, and was thus made the means of conveying preconcerted signals.

In a telegraph constructed by Mr. Alexander there were thirty wires acting on thirty magnets, about four inches long each. These magnets, when they were made to move, brought into view thirty small inscriptions, consisting of the twenty-six letters, and the comma, colon, &c. At the other end of the arrangement was a key-board, something like that of a piano-forte, containing thirty keys. On pressing down one of these keys (which were marked with the same symbols as those at the magnet-end of the machine, and each of which was joined to its own particular wire), the wire to which it was attached was brought into connection with a galvanic battery placed under the key-board. The electricity thus excited flowed through the wire connected with that key, acted on the

magnet at the other end, brought into view the desired symbol, and returned by another wire to the battery. If the letter A for instance were required, the key A would be pressed down, the wire A would become a channel for the electricity, and the inscription A would be rendered visible by the motion of the magnet. It must be borne in mind that the telegraphic power of such an arrangement as this depends on the fact, that however long the wires may be, whether yards or miles, the electricity will flow through them almost instantaneously, in order to complete the circuit.

The great object to be attained in such an arrangement is to reduce the number of wires without lessening the number of symbols or signs, and this has been done to a very important extent by improved modes of arrangement. In Alexander's telegraph, one *return* wire was made to serve for all the thirty symbols; and it has been suggested that the thirty wires might be reduced to fifteen, by making each magnet act on two symbols. In Mr. Davy's telegraph six wires are made to produce a very large number of signs, and are also made to ring a little bell, three strokes being intended to draw attention, two strokes implying the end of a sentence, and one the end of a word.

But by far the most important labours bestowed on this subject are those of Professor Wheatstone, who, in conjunction with Mr. Cooke, has made a large number of experiments, has taken out several patents for successive improvements in the machinery, and has surmounted most of the obstacles incident to such delicate scientific operations. The construction of railways offers great facilities for laying down a length of wire out of reach of harm; and in 1839 a telegraphic system was established from London to Drayton, on the Great Western Railway, as well for a trial of the apparatus, as for certain prospective advantages to the Company, should the attempt succeed. The nature of this telegraph—according to the evidence given to parliament, and contained in the Fifth Report of the Parliamentary Committee on Railways, published towards the end of the last session—is briefly as follows:—

An iron tube, laid along near the ground, contains a bundle or rope of five or six wires, each insulated from the others by a coating of cotton and India rubber, and the whole coated in a similar manner. These wires serve to convey twenty or thirty signals, by a most ingenious arrangement of magnets, which may be illustrated thus:

Suppose (1) that five small magnets be ranged vertically side by side, and each turning on a central axis: if (2) the second and fifth be made to converge upwards, a certain letter would be indicated; if (3) the first and fifth converge downwards, another letter or symbol would be expressed: if (4) the second and fourth converge upwards, a third symbol is given; and so on, two of the five wires being made to converge either upwards or downwards. Now it is easy to see that a great number of symbols may be thus expressed by the use of five wires acting on as many magnets; the magnets being made to partially rotate by an electric current passing through coils of wire behind them. The symbol expressed will depend on which wire conveys the electric agent, and which returns it to complete the circuit. The person who is to send the communication has a small machine before him connected with the battery, and provided with ten keys or plugs, by the pressure of which the electric current is communicated to the wires,—two keys to each wire. He selects those two wires which will give the requisite symbol, and presses down one of the two keys connected with each of them: the electric current then passes along one wire, returns by the other, and turns the two magnets at the remote end of the line. As there are two keys to each wire, and two wires employed for each symbol, two of the keys will make the same two magnets converge *upwards*, and the other two *downwards*. At each end of the line are machines both to communicate and to indicate, that is, to transmit and to receive intelligence; and in order to call the attention of the telegraph officer at the remote station, a separate wire is employed to ring a bell, by transmitting an electric current to a small magnetic arrangement connected with a bell at the remote end. On hearing the bell, the officer looks at a sort of dial or indicator connected with the magnets, and observes the symbols as communicated one by one, and which may succeed each other at the rate of thirty in a minute.

Such were the chief points as detailed to the Committee, with respect to the thirteen miles of wires originally laid down from London to Drayton, and illustrative of the general nature of the operation. But Professor Wheatstone has been actively engaged in improving every part of the apparatus; since the trial on the limited line of railway was rather to test the power of the telegraph than for immediate commercial utility. In successive improvements, secured by patent, but not yet introduced on the railway, Mr. Wheatstone has reduced the number of the wires, simplified both the mode of communicating and that of indicating on a dial the symbol communicated, provided the means for introducing fixed telegraphs at intermediate stations, and portable telegraphs at interval of a quarter of a mile, &c. These experiments have been and are now being carried on along the line of the Great Western Railway; and it is extremely probable that by the time this great undertaking is completed, the telegraphic arrangements will have arrived at a degree of simplification and completeness fully equal to all that has been anticipated from them. This question is of much larger importance than its mere connection with railways. Whoever considers how important an element time is in all the relations of society, will easily see the advantage of communicating intelligence instantl from one end of the kingdom to the other—a feat which we regard as within the bounds of probability. Already attention is being directed to the employment of the electrical telegraph—not only for railway purposes, but for government communications, and also for the conveyance of such private commercial messages as may be comprised in a few words; and a good deal of the evidence given before the Parliamentary Committee had relation to this subject.

We have professed to give merely a summary of the various modes of communication by telegraph, without entering into those minute details which require lengthened description to be well understood. The reader will probably see reason to believe that the time is not very far distant when electrical telegraphs will supersede all others, and distant towns will communicate with a speed literally and truly that of lightning.

Spread of British Manufactures.—I may note a remarkable fact, to show how much we and the Afghans are mutually interested in making the Indus a cheap channel of trade. Syud Keramut Ali, in 1834, got from merchants with whom he was intimate samples of all the manufactured "Russian goods" imported *viâ* Bokhara, and which were then selling at the usual good profit in the Cabul bazaar. I lately gave a set of these to a gentleman interested in our trade with the East, when he ascertained from an experienced merchant, to whom they were forwarded, that more than two-thirds of them were of Glasgow and Manchester make.—*Conolly's India.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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BRITISH AGRICULTURE.

OCTOBER.

[Emblems of October.—From Saxon Calendars Hawking; Cotton MS., Tib., B. 4. Sowing; Lansdowne MS., 381. Picking Grapes for Wine; Lansdowne MS., 383.]

The glory of the summer has now passed away, and winter, with its train of rains, fogs, storms, frosts, and snows, will soon overtake us. During the present month, however, the meadows and pastures continue to wear a modest though not a vivid green: and notwithstanding the leaves on the trees are becoming seared and shrivelled, while those that are the tenderest and most susceptible of cold are often by the middle of the month seen flickering from the branches they adorned and beautified during their brief summer, still the hedge-rows and the groves do not present the absolute sterility of winter nakedness, for that is rarely brought to pass until the blasts of November have scattered the remnants of the past season. By the beginning of the month, however, we frequently find the woods and groves assuming all the varieties of tints that nature's pencil alone can impart.

> "But see, the fading many-coloured woods,
> Shade deepening over shade, the country round
> Imbrown; a crowded umbrage, dusk and dun,
> Of every hue, from wan declining green
> To sooty dark."*

During the early part of the present month, or sometimes during the latter part of September, the martins and swallows that have raised their broods—probably two, and sometimes more, under the eaves of our own dwellings, or upon the beams and rafters and inner walls of our barns and outbuildings—begin to assemble in numerous flocks, evidently preparing for their departure: the gathering of the swallows is an epoch in the seasons in every part of the country. Other summer birds take their departure with less parade and preparation, and the common opinion that the swallows are bound for some far off country, serves to increase the interest connected with their disappearance. The few birds that repair to our shores as the winter approaches create but little interest compared with those that come to spend their summers here; though to the sportsman a numerous arrival of woodcocks is a matter of peculiar satisfaction, and the youthful gunner hails with delight the appearance of large flocks of fieldfares, which, quitting the colder regions of Norway, come to pass the winter amongst us, probably finding a more plentiful supply of wild berries and other food than in their native Norwegian wilds. It is commonly said that when the hawthorn hedges are loaded with haws, that we may look for numerous flocks of fieldfares. There is another old superstitious prediction respecting these said haws, to the effect that "many haws betoken many snows," or, in other words, a severe winter.

* Thomson's 'Seasons.'

Since autumn is the season when the ordinary round of farming business may be said to commence anew, and when the possession of lands is commonly changing, this appears a fitting opportunity for offering a few remarks upon the subject of renting and stocking farms in general; for although the rent of a farm may not be too high, a want of attention to this latter particular may very often account for the want of success in farming. We frequently see indications of a strong desire in the farming community to undertake larger farms than prudence would allow, or than a limited capital could possibly stock and cultivate properly; by which means the parties thus acting not only find themselves embarrassed in their circumstances, being not only unable punctually to meet their engagements, but under the disagreeable necessity of neglecting something or other which they know requires immediate attention in order to obtain therefrom any ultimate gain or advantage. To be aware of this cannot fail at all times to be both irksome and annoying; and the better the farmer understands the management of his crops, &c., the greater will be his mortification to see his lands neglected for the want of sufficient capital to enable him to cultivate them properly. Moreover, we have sometimes known it happen that a farmer, in consequence of a want of capital to enable him to manage his affairs properly and judiciously, has undeservedly acquired the reputation of a bad manager, which ever after has stuck to him, when, had he possessed the means, not any of his neighbours would have cultivated their farms better or more judiciously, nor have sustained a fairer reputation among the best class of farmers.

The disadvantages of engaging in a larger farming business than a person's means will warrant, is certain to involve him who does so in a numerous train of difficulties, and to reduce his profits upon all the produce which he may have to dispose of. If his capital will not allow him to purchase sufficient stock of the proper kind and quality, it cannot but be clearly apparent that his profits upon this particular head will be smaller than they otherwise might have been. And as respects his crops, either the requisite amount of labour and expense will not be bestowed upon them, or else not in due season; so that under ordinary circumstances it would be absurd in him to look for as good crops as those on the adjoining farms where ample means had been enjoyed of bestowing all necessary care and expense upon them. Then, as regards markets, the needy farmer is ever obliged to have recourse to his stock or his stack-yard to meet both the direct and incidental expenses that may come against him and his establishment, whereby he has not an opportunity of regulating his sales by the rise or fall in the market prices, for he *must* sell, however low the markets may be, in order to meet the ordinary payments that are continually coming against a farmer for domestic supplies, wages, taxes, rent, tithes, &c. How differently off is the farmer who has got a little surplus capital in the corner of his chest, or in some secure institution where he can at any time command it, should an advantageous outlay warrant its investment. Besides, should an unfavourable season take place, or a great depression of prices in agricultural productions occur, he will then be able to reserve his stock and crops instead of disposing of them at a great disadvantage, his small reserved fund or capital being sufficient to meet all immediate demands.

We frequently hear it asserted that nothing is to be made upon small farms; but this we consider a rather vain and vague assertion: for it seems to involve a principle which has been the ruin of thousands. It is not to be expected that wealthy practical farmers should be contented to sit down on small farms where large ones are to be had, provided their intention is to make farming a business; but we must insist upon the soundness of our general principle—that where parties are possessed of but small capital (of course we mean in the farming line) they had much better refrain from involving themselves in a maze of difficulties by entering into engagements that would require a much greater amount of capital than they can command, and which in a very few years might reasonably be expected to end in the landlord's taking possession of the stock, crops, &c., in order to secure the rents that would have become due to him: and whatever opprobrium they may conceive attached to the term 'small farmers,' they had infinitely better submit to it with a becoming grace, than, by giving way to a foolish ambition, lose all they ever possessed, and end with having their names enrolled in the list of common labourers, and probably close their career in the parish poorhouse.

Notwithstanding farm-produce realises good prices at present, farmers possessed of small capital, like persons of small capital in the trading community, ought not to expect to do much more than earn a mere livelihood; although superior management, attended with a train of unusually fortunate circumstances, will occasionally enable a small farmer ultimately to become a larger one. In reference to the proper management of farms in general, an anonymous writer, but evidently a person of experience, makes the following very judicious remarks:—"The bad success of great numbers of farmers is owing to their not having sufficient capital to begin with, which inevitably involves them in difficulties, and reduces their profits upon every article of produce. Their farms are understocked; they necessarily sell at a disadvantage, their fields are scarcely half cultivated, and in a short series of years, unless some lucky hit sets them up, they become abjectly poor, in spite of all possible industry, judgment, and application: even a low and easy rent will seldom remedy the want of money at setting out."

Next to the want of capital in farming in order to ensure success, is the want of judgment; and where this is the case, we usually find either too much or too little stock upon the farm, and the kind and quality of it not at all proportioned to the nature and extent of the productions of the soil. One would suppose that it required no great deal of experience to be aware of the fact, that ten milch-cows, well fed and properly attended to, will yield a greater profit than twelve or even fourteen that are ill fed and otherwise neglected. And as the writer above quoted justly remarks—"It would be more to the farmer's advantage were he always to remember that three beasts of any kind, sheep, oxen, or cows, well fed, pay better than four would without the proper supply of food." But too little stock, as well as too much, may be kept, and either extreme is equally wrong. It is not, however, altogether in the improper manner of stocking a farm that the want of judgment is apparent, since the nature and amount of agricultural implements necessary to carry on the various processes of husbandry upon a farm of a certain extent should be clearly comprehended by the practical farmer; for where there are many more implements and utensils than are really necessary, it is ten to one that those not in use will not have proper care taken of them. Besides, capital thus invested would be uselessly sunk. On the other hand, a deficiency of those things most commonly employed about a farm is a continual inconvenience, and often causes a great sacrifice and waste of time. But the skilful farmer will take Tusser's advice, and employ "Thrift's officers," and thereby ensure his complete success:—

> "Make money thy drudge, for to follow thy work,
> Make wisdom comptroller, and order thy clerk;
> Provision cater, and skill to be cook,
> Make steward of all, pen, ink, and thy book.*"

If implicit credit is to be attached to the records of olden times, as connected with practical agriculture, there seems but little doubt that those who might then be considered the better class of farmers were accustomed to

* 'Good Husbandry Lessons.'

sow their winter grain, that is, their wheat and their rye, a few weeks earlier in the season than is at present approved of; for immediately on the crops being cleared away, the ground was forthwith prepared for the reception of another crop; and as early as practicable the seed was again committed to the soil; so that in the more favourable districts seed-time was mostly over by the end of September. In Tusser's time early sowing was generally practised; and in his 'September's Husbandry' he strongly urges—

> "Thresh seed, and to farming, September doth cry,
> Get plough to the field, and be sowing of rye."

And he further adds—

> "Sow timely thy white wheat, sow rye in the dust,
> Let seed have her longing, let soil have her lust:
> Let rye be partaker of Michaelmas spring,
> To bear out the hardness that winter doth bring."

In those days, however, the general practice of cultivating the various sorts of soils differed so greatly from the present, that it would be difficult to arrive at any solid basis upon which it might be safe to found a direct opinion as to what degree the custom of early sowing was in itself radically bad; for it should be borne in mind that a couple of centuries ago there were no large tracts devoted to those enriching and ameliorating crops —turnips and potatoes, besides various other sorts of green crops; nor was the system of raising artificial grasses, which has done so much in the way of benefiting agriculture, known or practised to any extent in the very best farmed districts. Neither at the period referred to were manures so easily procured, or their nature and properties so well understood, nor were they so generally considered beneficial, so that by far the greater portion of what we call winter grain (from its occupying the ground during the winter season) was sown upon ground that had been summer fallowed but not manured, or upon stubbles that were not so overrun with grass and weeds of various descriptions as utterly to preclude every chance of another poor crop of corn of that description; for in those days there were only imperfect rules and regulations about certain crops succeeding or not succeeding each other; so that when once a piece of ground had been broken up and sowed with corn, so long as it continued to yield sufficient to discharge the moderate cost at which it was cultivated, so long was it subjected to this miserable practice of cropping. Some persons, however, seem to have adopted the ancient Roman process of burning the stubbles for the two-fold purpose of destroying the weeds and partially manuring and ameliorating the soil, though the amount of ashes could have been but trifling. It should be borne in mind also, when comparing the ancient with the modern system of the management of lands generally, that in the ages that are past there were none of those various improved implements for destroying weeds and cleansing land that we now find in general use, as well as the most perfect and suitable tools of every description. Formerly the ploughs were of the rudest and most imperfect construction, while the best of the harrows were those of a triangular shape, constructed of the fork of some tree; the number of tines or teeth, which for the most part were only wooden ones, seldom exceeded seven, one being placed at the intersection of the two sides, and the remaining six equally divided—that is, three distributed on each side. Such were the implements employed in putting in the corn crops; and as manure was but rarely bestowed upon them, it need not be a matter of surprise that they usually were both very precarious and uncertain, and their very best crops were far inferior to those of the present day.

A very considerable portion of the cultivated soils, however, in those early days consisted of common or unenclosed lands, subject to peculiar local regulations respecting the catage or pasturage of cattle, sheep, &c., over which a tenant individually possessed no control; so that it would often happen that the crops would be exposed to depredations and annoyances which farmers now are not forced to submit to; for although we occasionally find practical agriculturists adopting the system of pasturing down their crops of young wheats that may have become what they consider too forward and luxuriant, yet this is done with peculiar care and attention, and not left to chance, or to the caprice of others. There is no doubt but crops will sometimes be improved by being thus pastured down; for it has, among other effects, that of making the plants 'stool' or spread, and throw out more stalks, or bearing straw, than would have been the case had not this plan been resorted to. One of the greatest objections to early sowing has ever been the advantage it gives to certain weeds of making considerable progress, and getting firmly rooted in the ground before winter sets in; for the wheat plants, if the season happens to be severe, are mostly cut down to the ground, while the weeds continue to resist the frost, and so get a start when the milder weather in the spring comes on, that they could not have done if the grain had been put into the ground a few weeks later. Owing, however, to the improved system of farming, the crops of winter grain are now comparatively little infested with weeds; although there are here and there individuals still to be met with who suffer all sorts of weeds to infest their crops, not only to their own loss and disadvantage, but frequently to the injury of their neighbours, since many weeds disseminate their light seeds over the adjoining fields and farms.

We are, however, by no means the advocates of late sowing; and we have remarked elsewhere, that a week or two earlier or later is often a matter of little moment; for when the weather is favourable for sowing, and the soil in a sufficiently forward state of preparation for the reception of the seed, we would strongly recommend the husbandman not to let pass so favourable an opportunity, though the period should be somewhat earlier than he fully approves of. Or were the case reversed, we should recommend a little longer delay than otherwise might seem desirable, in preference to putting in the seed before the ground be thoroughly prepared to receive it, or while, from previous rains, it is in too wet a condition.

> "Who soweth too lateward, hath seldom good seed;
> Who soweth too soon, little better shall speed:
> Apt time and the season so diverse to hit,
> Let aier and layer help practice and wit."*

It is not a little remarkable that for a considerable period after the introduction of sundry improvements in the practice of farming, the early sowing of winter grain was in most cases insisted upon; whereas it became the custom to sow the spring crops later than had heretofore been the general practice. But as the cultivation of green crops began to be more attended to, and the soils, through them and other improved modes of cultivation, became in a much better condition, experience soon convinced the unprejudiced practical farmer that it was quite possible to have his winter grain in the ground at too early a period, and consequently too far advanced when winter came on; for he found, that upon fertile soils, or those artificially made so, early-sown crops were by no means calculated to ensure abundant returns when the produce came to be gathered into the granary. While with respect to spring grain it was ascertained that, in most instances, the late-sown crops were the most deficient in yield. A change, consequently, has gradually been brought about of something like a month as regards the putting in of the winter grain, and, under certain circumstances, of a considerably longer period; but no

* Tusser, 'March's Husbandry.' Upon the above quotation, we find Dr. Mavor remarking as follows:—"By *aier*, or *air*, is to be understood whatever depends on temperature, weather, and exposure: by *layer*, whatever depends on soil, culture, and its concomitants."

circumstances should be allowed to interfere beyond moderate and reasonable limits; for although success may occasionally attend extremes in sowing and planting, every practical farmer is aware that success on one occasion is a sorry offset against half a dozen failures.

In order that the husbandman should ever be in a condition to embrace the most approved season for depositing the seed in the earth, he should never, under any plea or consideration, allow himself to be behind with his work; since frequently about this period of the year the weather becomes so unsettled, and so much inclined to rain, that it is now no season to be depended upon for making up for opportunities that may have been permitted to pass away unimproved at a much earlier and more settled season of the year. When the soil is so wet at the time the seed is sown as to render it difficult to work it with the common agricultural implements, there are several things which operate against its yielding a good crop. As the surface, under such circumstances, will usually be less smooth or even, the seed in all likelihood will be less equally distributed; and when covered by the harrow or the plough, if no other portion of it rots and becomes totally lost, that which is poached or trod into the ground by the feet of the horses or cattle is sure to be so. But, upon most soils, under such circumstances, it will be a very difficult matter to cover the seed at all as it ought to be; for no plough or harrow was ever yet invented that did not, in tenacious and clayey soils, become clogged with earth more or less, so as partially to drive the seed before it. Soils of this nature, after being stirred in too wet a condition, are sure to consolidate, or bake, as it is commonly called; and nothing so much retards the growth and impoverishes young plants as the surface of the soil becoming reduced to this condition, for it commonly remains in such a state until the breaking up of the winter frosts. Neither when the soil is wet can the seed by any possibility be so equally covered as when the soil is in a dry and manageable state; and, when this is the case, the consequence will continue apparent even until the time of harvest; for during the whole season the plants will exhibit an inequality in their growth, and the crop will not ripen evenly and equally as it otherwise would have done.

It is quite true that some sorts of soil may be worked too much, that is, until they become so finely pulverised that they do not afford sufficient stability to the plants as they grow up; while a very fine tilth is also liable to bake, as well as land that is worked when wet; for should a heavy fall of rain take place, so as to make the surface quite smooth, it is in danger of becoming baked or consolidated when bright sunshine succeeds. Any one that may have noticed the effect that is produced by pouring large quantities of water upon flower-borders or garden-plots, where the soil has previously been finely pulverised, will perfectly understand the nature of this baking of the soil here referred to; and although it would be impossible to avoid it altogether, care should be taken to prevent it as much as possible. An implicit adherence to this or that rule in carrying out every or indeed almost any part of practical farming to an extreme degree of nicety cannot be altogether recommended; but no general and established principle should be left incomplete where it has been clearly and satisfactorily ascertained that, without certain attentions and processes, the object to be attained can hardly succeed. As connected with this subject, and in order to illustrate some of our observations, we would refer our readers to the wet season which occurred last autumn; indeed the weather was rainy during a considerable part of the summer, which greatly retarded the preparation of the ground intended for winter crops; so that when the period approached for sowing, the rains again succeeded, and the low lands in many parts of the country continued so saturated or flooded, until the end of the year, that it was found impracticable to get in the seed at all with any prospect of a crop. This was looked upon as a great misfortune to the farming community at large, and great was the perplexity in many instances respecting what course it would be the most advantageous for the husbandman to adopt. Some of them were determined to have their seed in, however unfit the soil might be for its reception; while others submitted to have their regular system of crops partially interrupted, and awaited the wasting of the waters. As it happened, those who had exercised their patience were the gainers in the end; for with the new year the state of the weather presently begun to improve, and one month after another continued remarkably favourable for all sorts of husbandry. Nevertheless, as a general prejudice has grown up against cultivating spring wheat, many of the farmers that had intended their lands for winter wheat, were induced to sow barley, and thus probably experienced a trifling loss; but those who ventured to put in wheat during January and February, and, in some districts, many farmers did so, the spring and summer proving favourable, they mostly were rewarded with very tolerable crops; and, what mended matters, their regular course of cropping suffered no interruption. However, in both cases, the harvest that is just ended has fully proved how greatly it was to the advantage of those who waited for a favourable season, and did not attempt to sow their ground while the soil was full of water, since nearly all such attempts failed, as most of the ground treated in that way had to be ploughed up in the spring at a sacrifice of the labour and the seed bestowed upon it; while most of the crops of spring wheat succeeded remarkably well, so as in some measure to redeem its character even where it was held in bad repute.

Every farmer, horticulturist, and florist is fully aware that good seed is one of the most material requisites towards ensuring good crops; for where the seed is in any way defective in quality, it is next to impossible that the crop that it yields should be perfect in both quality and quantity, and, where grain alone is concerned, should be such as is calculated to give satisfaction to the producer, the miller, the baker, and the consumer; and yet it is no uncommon thing to find this great and leading feature of good management neglected. It may not, to be sure, at all times be practicable to procure the very best quality of seed, where the farmer happens not to possess it himself; although in a majority of cases he will be able to accomplish his wishes. Change of seed is now so generally recommended, that it would be superfluous to add anything in its praise, and dangerous to utter a syllable against it; and yet we cannot refrain from strongly expressing it as our decided opinion, and put it in the shape of a question to all farmers and other producers of the necessaries of life, whether it is not the safer plan to stick (at least for a moderate period) to such seed as experience has fully proved to be of a superior quality, in preference to discarding it for some fanciful or new-fangled sort, the virtues of which have yet to be tested and fully proved? Those who cultivate farms of a pretty large size commonly command some variety in the nature and quality of their soil, so as to allow of their changing the same seed from one sort of soil to another; and where that is the case, the adoption of such a plan is much safer and more satisfactory than that of introducing some new species of grain that may possess a good reputation, but which might not succeed upon his farm so well as he had been led to expect. But even amongst those who are the strongest advocates for the change of seed system, some diversity of opinion is apparent; since some of the parties seem to consider that the soil becomes sick (to make use of an expression of their own) of such crops as are continued to be raised upon it for a succession of years; while others assert that the falling off of the quantity or quality in the produce is in consequence of the crops becoming sick of the soil.

However, this seems a matter scarcely worth discussing, since if by a long continuance of sowing the same kind of seed upon the same nature of soils the crops evidently become deteriorated in quantity or quality, and consequently lessened in value, it matters little whether it be the soil or the seed that becomes sick, since the result in either case will be precisely the same.

Since the consumption of wheaten bread has become so general in almost every part of the country, the success of the wheat crop, above all others, has become a matter of paramount consideration with the agricultural interest. Such being the case, much pains have been taken to render its cultivation as perfect as possible; not only as regards the quality of the grain, but every circumstance connected with the entire process, from the first furrow that is turned up in the early preparation of the soil for the ultimate reception of the crop, until the period when it has been secured at the close of the distant harvest. Great pains and expense are, therefore, often bestowed upon soils that are naturally poor, and that are but indifferently adapted for the production of wheat; and when at last the ground has been brought into a fit condition for the reception of the seed, that, as previously stated, should be selected with extreme care. Then the question arises respecting the best mode of putting in the seed, for there are several different plans of doing it, namely, harrowing it in, ploughing it in, drilling it in, or dibbling it; the last-named method, however, being but comparatively little practised, notwithstanding that it effects a considerable saving in the quantity of seed; for, since it has to be performed by hand, the process is a tedious one, and unless wheat were unusually scarce and dear, it is hardly probable that dibbling will ever become general where the crops are on an extensive scale. But in which way soever the seed is deposited in the ground, it is necessary that it should be of a good quality in itself, and at the same time free from infection or disease, as well as from the seeds of obnoxious weeds and plants, either of which might have an injurious effect upon the future crop. Smut, probably, of all others, is the worst thing that can affect a crop of this grain, and hence the numerous precautions that we find adopted to prevent it. Experiments almost innumerable have been tried, from time to time, and although several of them have fearlessly been pronounced absolute preventives or antidotes, even at the present day there does not appear to be any general remedy. We are inclined to believe, however, that at present the antidote against smut the most generally in use is that of steeping the seed-corn in lime-water, or in brine, or lye, and afterwards dusting it with newly-slacked lime; the steeping has the effect of removing all light or imperfect grains, and the effect produced upon the sound ones by the application of the ingredients referred to is supposed not only to remove any infection or disease that the seed might previously have imbibed, but also to invigorate the growth of the plants during their progress towards maturity, besides rendering the crop free from smut at the time of harvest. But experience has fully proved that neither this nor any other treatment will, at all times, and in all cases, prevent the appearance of smutty ears though the crops are under the very best management; and hence it is believed that, besides the seed having been more or less affected with this distemper, there are other causes which tend to produce it; and many of our first-rate practical farmers are of opinion that the nature of the seasons, as well as the quality of the soil, has something to do with increasing or lessening the quantity of smutty ears that are found to infest crops that have been carefully attended to; but to what extent these matters would affect a crop of well-farmed wheat would be exceedingly difficult to ascertain. However, on all hands it is admitted that due care and attention should be bestowed upon the seed; and although the very best seed may happen to fail, with seed of an imperfect or inferior quality it would be absurd to look for perfect success.

Besides smut, there are other things which occasionally affect wheat-crops, among which may be reckoned blight, mildew, and rust; but since none of these are considered to be so greatly dependent upon the quality of the seed, but more particularly upon circumstances connected with the seasons, they do not appear to come under the class of evils over which the husbandman possesses an immediate control. Then in relation to various sorts of weeds and plants that frequently infest the soil, even where it is well cultivated, it would now be unpardonable, when ingenuity has done so much in the way of providing improved fanning and winnowing machines, to allow their seeds to remain in the grain when dressed, and so be introduced along with the seed-corn at the time of sowing it; and such a piece of neglect or mismanagement would seriously injure the reputation of any practical agriculturist. It may be true that a careful weeding and hoeing in the following spring might have the effect of freeing, in a great measure, the crops from both the weeds that had been suffered to remain in the soil, as well as such as had been introduced with the seed; yet as prevention is always better than cure, there never ought, among good farmers, to be any necessity for resorting to such a remedy.

Some diversity of opinion still exists respecting the age which various seeds ought to have attained at the time of sowing or planting them, and amongst those the proper age for seed-wheat, some persons alleging that the seed should invariably be new, that is, of the crop but recently harvested; while the majority appear to be of the opinion that the seed which is a year old is to be preferred. In Tusser's time it would appear that new seed was commonly used. But at a much more recent date than that of Tusser's writings, the farmers who were very particular in such matters used to take the trouble to pick out the best and finest of the ears for seed; but then, most of the corn-crops were unequal and defective, so that many of the ears yielded grain of a coarse, light, or inferior quality; and in those days it was a more difficult matter to separate the best from the inferior sorts at the time of dressing it. A practical writer of the last century makes the following remarks upon seed-wheat, which are well worth the husbandman's attention:—"I should prefer to sow that which was a year old, provided the year it was gathered in had been warm and dry, to that which has been gathered in a season somewhat inclined to rain; for in wet seasons all the productions of the earth are inferior, from their not attaining a like degree of perfection, the seed not being so well-flavoured and free from moisture, nor does it keep so well. Partly owing to the reason here adduced I always prefer having my seed from the crops raised upon high and dry lands, rather than from such as are grown on the low flats or marshes, and having some extent of both these descriptions of ground upon my farm, I have, from time to time, availed myself of trying experiments, in order to become fully convinced of the soundness of this opinion; and I now feel quite certain that what I have stated above will be found to be fully borne out in the general practice of farming."

At the present day we find wheat known under such a variety of names—almost as numerous as the different districts of country in which it is cultivated—that it would be perfectly useless to attempt to enumerate them; for the very same sort of grain will be found under half a dozen different names in the same number of local districts of the country. Then some kinds acquire new names by their travelling to foreign countries, which is not a little amusing. For instance, a great number of years ago the old-fashioned Lammas white wheat was introduced into our North American colonies, before the Revolution took place and the United States declared their independence. The cultivation of it, amongst several

other sorts, became generally extended from one part of the country to another, frequently changing names as it passed from one state or colony to an adjoining one, at the whim or caprice of the parties thus introducing it, until many years ago it found its way into Upper Canada under the fascinating name of the Virginia silver-straw; and, proving a useful sort of grain for the wheat-lands of the upper province, it soon became more generally cultivated than any other sort; but in the mean time the old title was sunk, and it acquired that of the Canada flint wheat: some twenty years ago a farmer introduced it into the West of England, direct from Canada, under its new title; and there is little doubt but the same parties who had been familiar with Lammas white wheat in their younger days, looked upon this new introduction from Canada as an entirely new sort, probably either not knowing better or not taking the trouble to recollect that all the different sorts of wheat produced at present, both in the United States and the Canadas, were originally introduced from European countries, and most of them direct from Great Britain. However, generally speaking, our prices current recognise only these two distinctions, namely, white and red; so that it is for the experienced farmer to consult his own interests, and among the several varieties of each to make a prudent selection, since there is no manner of doubt but that some sorts are better suited to particular soils and situations, and modes of treatment, than other sorts would be, for they are neither all equally hardy, prolific, nor of the same quality.

Some of the red wheats, from their hardier character and coarser quality, will bear sowing very late in the season, and there seems but little doubt that what is now commonly called spring wheat is nothing more than a hardy sort of red wheat, which has, by frequent late sowings, at length become reconciled to maturing its seed although not introduced into the ground until the early part of the spring; and it is a well-known fact to most persons familiar with the cultivation of crops in general, that the nature of most kinds of plants may be in some measure changed by subjecting them to a different mode of treatment to that which they may have heretofore been accustomed to.

We give below the results of a careful experiment on the relative values of several varieties of wheat, made by John Morton, Esq. of Chester Hill, near Stroud.* The planting was performed with mathematical precision, the seeds of each variety being planted at equal distances, and they were the best and plumpest that could be obtained. The soil was a stonebrash about ten inches deep. The results are shown in the table; but it is necessary to remark that many experiments are necessary to arrive at satisfactory conclusions.

The proper selection of seed is indeed a matter of national importance. In England and Wales alone the wheat produced one year with another is estimated at about 12,350,000 quarters, the average produce per acre being perhaps twenty-six bushels. If this amount could be raised to twenty-seven bushels by a better selection of seed, 475,000 quarters of wheat, worth, at 50*s*., about 1,200,000*l*. yearly, would be added to the national wealth The question of sowing grain thick or thin is far from being satisfactorily settled, each practice having its advocates; yet a saving of half a bushel of seed per acre would be a gain of 240,000 quarters, or 600,000*l*. to the country each year. It is only by discussion and experiment that the best practice is likely to be generally adopted. In some parts of the country there are Clubs of practical farmers who meet for the excellent purpose of discussing doubtful points of agricultural science; but such institutions are unfortunately rare. We recently saw a Report of one of these clubs established at Harleston in Suffolk, which shows their great practical value. Alluding to the keep of farm-horses which had been under discussion, the Report states:—"Your Committee, in common with every member of the Club, was astonished to find that, amongst a body of farmers, all residing within four or five miles of the place of meeting, all using a similar breed of cart-horses, and cultivating a similar description of land, such an astonishing difference in the expense of maintaining their cart-horses should exist, amounting, in authenticated statements, to upwards of 50 per cent.,

* Vol. i., page 41, of the 'Journal of the English Agricultural Society.'

When planted.	No	Name of Wheat.	No. of seeds planted.	Loss of seeds from birds, frost, &c.	Produce of 99 square ft. Plants or roots.	Produce of 99 square ft. Heads o' grain.	No. of ears in one square foot.	Average No. of heads per root.	Weight of grain produced from 99 square feet.	Weight of wheat per acre.	No. of bushels per acre, at 64 lbs. per bushel.	Length of straw.	Weight of straw produced from 99 square feet.	Weight of straw per acre.	Weight of roots with 2 in. of stem.	Weight of roots per acre.
									lbs.	tons. cwt. qrs. lbs.		ft. in.	lbs.	tons. cwt. qrs. lbs.	lbs.	tons. cwt qrs. lbs.
Nov. 15	1	Old Red Lammas	792	387	405	2463	25	6	6	1 3 2 8	$41\frac{3}{4}$	5 8	$16\frac{1}{2}$	3 5 2 24	5	0 19 2 6
..	2	Golden drop	792	291	501	2542	25	5	$6\frac{3}{4}$	1 6 2 8	$46\frac{5}{4}$	5 6	$15\frac{1}{4}$	3 0 0 3	$5\frac{1}{4}$	1 0 2 14
..	3	Ten-rowed prolific	792	391	401	1937	19	$3\frac{2}{5}$	$4\frac{1}{2}$	0 16 2 16	27	5 5	$12\frac{3}{4}$	2 10 0 10	5	0 19 2 6
..	4	Hunter's	792	273	519	2028	20	$4\frac{1}{5}$	$4\frac{1}{2}$	0 16 2 16	27	5 6	$12\frac{3}{4}$	2 12 0 10	5	0 19 2 6
..	5	Thick-set Suffolk	792	120	672	3039	30	$4\frac{1}{2}$	$10\frac{1}{2}$	2 1 1 0	$72\frac{1}{4}$	5 8	$19\frac{1}{2}$	3 5 2 14	$7\frac{1}{2}$	1 9 1 24
..	6	Hickley's Prolific	792	132	657	2886	29	$4\frac{1}{3}$	$10\frac{1}{6}$	1 19 3 3	$69\frac{1}{2}$	5 7	$16\frac{1}{2}$	3 5 2 24	$6\frac{3}{4}$	1 6 2 8
16	7	White Taunton	792	305	487	2695	27	$5\frac{1}{4}$	6	1 3 1 20	$41\frac{1}{2}$	5 6	$15\frac{1}{4}$	3 0 0 0	$5\frac{1}{2}$	1 1 2 12
..	8	Silver drop	792	218	574	2582	26	$4\frac{1}{2}$	8	1 11 1 20	55	5 6	$18\frac{1}{2}$	3 12 2 12	6	1 3 2 8
..	9	Scotch white	792	379	413	2386	24	$5\frac{3}{4}$	$6\frac{1}{4}$	1 4 2 6	43	5 9	$16\frac{1}{2}$	3 5 2 24	$5\frac{1}{2}$	1 1 2 12
..	10	Talavera	792	434	358	1985	20	$5\frac{1}{2}$	$5\frac{1}{4}$	1 0 2 14	36	5 8	$14\frac{1}{2}$	2 16 3 14	$5\frac{1}{2}$	1 1 2 12
21	11	Smithers' Hereford white	792	319	473	2529	25	$5\frac{1}{3}$	$9\frac{1}{2}$	1 17 1 8	$65\frac{1}{2}$	5 6	$17\frac{1}{2}$	3 8 3 20	5	0 19 2 0
..	12	A red wheat	792	252	540	3453	35	$6\frac{2}{5}$	12	2 5 1 12	$82\frac{1}{2}$	5 0	22	4 7 0 2	9	1 15 2 6
..	13	EgyptianCone	792	528	264	711	7	$2\frac{1}{3}$	$3\frac{3}{8}$	0 13 0 24	23	6 0	$8\frac{1}{4}$	1 11 2 2	3	0 11 3 4
..	14	Red-straw Lammas	792	510	282	2096	21	$7\frac{3}{5}$	$4\frac{1}{2}$	0 16 2 16	27	5 8	$14\frac{1}{5}$	2 16 3 4	5	0 19 2 6
..	15	Blue cone	792	264	528	1626	16	5	6	1 3 1 28	$41\frac{1}{5}$	6 0	$9\frac{3}{4}$	1 16 1 16	6	1 3 2 8
..	16	Red cone	792	456	336	2446	24	7	10	1 19 1 4	$68\frac{3}{4}$	5 3	$12\frac{1}{2}$	2 9 0 0	$4\frac{3}{4}$	0 18 2 10

whether estimated at per head for each cart-horse, or per acre for the arable land." That is, on equal quantities of land, the horses of one farmer cost twice as much as those of another, whether arising from the different number of cattle or from the manner in which they were maintained. The Harleston Committee very properly ask—"What greater proof could be required of the necessity for discussion?"

The crops of grain, except in remarkably late seasons, and in situations peculiarly bleak and elevated, have usually been gathered in before the commencement of the month, but that valuable acquisition to the agricultural crops of this and many other countries, and which, among the lower orders, is frequently substituted in the place of bread—potatoes, is now commonly ready; the early sorts, however, being ripe and ready for gathering in at an earlier period. While it lasts, the potato-gathering is a very busy season; and when we take into consideration the immense quantities that are now consumed annually, their consumption is far from being limited to the supply necessary for the human race, for during the winter season, particularly in abundant years, large quantities are given to hogs and cattle. Bread-corn is invariably accounted the grand staple commodity of the agricultural districts, and with much propriety it generally may be considered as such; but nevertheless the potato crop comes in for a much higher degree of consideration than at first sight would seem to be the case. Indeed if we were to take weight against weight, and bushel against bushel, it has been calculated that the consumption of potatoes in the United Kingdom equals, if not exceeds, that of the various sorts of grain manufactured into bread: we do not make the comparison with the entire of the crops of what is generally understood by bread-corn, for immense quantities of grain are used in distillation, brewing, &c., besides what is consumed by all sorts of farm-stock and the whole fraternity of domestic animals. This, at a cursory view, would seem almost incredible,—for when we look abroad among the farming classes of the arable districts, we there discover that the number of acres of ground devoted to the raising of this useful and nutritious vegetable bears but a very small proportion to the quantity of land devoted to the growing of corn; indeed so much so, that the potato crops appear to occupy comparatively but quite insignificant spaces upon the generality of farms. It must be borne in mind, however, that one acre of ground, properly cultivated, will frequently yield three hundred bushels of potatoes (sometimes much larger quantities are grown), while an acre of wheat that produces thirty bushels is reckoned above an average crop. Hence it would appear, taking these quantities to found a calculation upon, that one acre of ground will yield as many bushels of potatoes as ten acres will bushels of wheat; so that a ten-acre field annually devoted to potatoes, upon a farm of two hundred acres, would yield as many bushels of the former as there were likely to be bushels of the latter, since not more than the one-half of any farm can annually be devoted to wheat crops—indeed seldom more than one-third, under the improved mode of agriculture. But besides the potato crops that are annually raised in the arable districts, in those parts of the country devoted to grazing, as well as where the farms are of a mixed character, crops of potatoes are more or less extensively cultivated; while the cottager, who has but a few perches of ground attached to his humble dwelling, will generally be found to have the whole or greater portion of it devoted to a potato crop. Moreover, in the vicinity of towns and populous communities, the market-gardeners among their general stock of vegetables raise considerable quantities of potatoes; though, perhaps, only for the supply of the markets during the early part of the season, for they commonly get a second crop of vegetables of some other sort from their early potato grounds; and hence it would appear that in addition to the crops generally grown by the practical farmers, vast quantities are produced elsewhere.

In the households of our nobility and gentry, as well as among the upper orders of the middle classes, there can be little doubt but a much larger quantity of bread and bread-stuff is consumed, than there is of potatoes; but with nearly all grades among the lower orders, the weight of potatoes consumed generally exceeds that of bread.

From the large quantities of potatoes that are, as we have shown, sometimes produced on the acre, it might seem to persons but little acquainted with the cultivation of crops in general, that potatoes must be an exceedingly profitable one. This, by no means, is invariably the case, for unless a considerable expense is incurred in cleaning and preparing the soil, and in hoeing and weeding the crops through the summer, a good crop need hardly be looked for. Besides, where manure is scarce and dear, another considerable item of expense will be incurred, for even when planted upon good soil, potatoes require the application of a larger quantity of stable manure than other crops do in general. There is, moreover, more or less risk, for the potato plant being one of those peculiarly susceptible of frost, either a very late frost in the latter part of spring, or an unusually early one in the latter part of summer, will often do a serious injury to a crop that had looked very promising. When it is practicable, they should be gathered while the weather is dry; or when that is not convenient, they ought to be spread upon the ground to dry before they are buried or enclosed in heaps, or hogs, or holes, or in the depositaries where they are usually kept, under whatever local name they may be known; for their quality is partially injured, and some few are apt to decay, when they are covered up in these holes in a wet and muddy condition. These places of deposit should be made judiciously; clean straw—or dry fern will answer equally well—should be covered over them sufficiently to keep the mould that is afterward laid thereon from finding its way among them; and although a sufficient quantity of earth to prevent the frost from penetrating to the potatoes has to be piled over them—and so compactly and judiciously as to throw off the rains to which the heaps will be exposed—too deep a covering is by no means to be recommended, for it will sometimes cause them to heat, and thereby induce a partial fermentation which invariably injures the quality. There is scarcely any other agricultural production that varies so greatly in price, between one part of the country and another, as potatoes do; much of which is owing to the heavy nature of the article, and hence the great cost of getting it to market where the means of transport are not of the most favourable nature. In London the York reds are esteemed among the best quality of potatoes in the regular supply brought to the London market, where, although the price does undoubtedly somewhat vary, few of the retailers of vegetables sell them at less than six shillings the hundredweight the year round; while, in the interior of Yorkshire, as also in some of the adjoining counties, where precisely the same sort of potatoes are cultivated, they frequently may be purchased in the small market-towns for one-third of that sum, or even at a lower rate. When the potato crops have been cleared away, the ground is mostly in excellent condition for the reception of winter grain, the soil, for the most part, being peculiarly free from grass and weeds, as well as in fertile condition.

By the latter part of the month the turnip crops are usually commenced upon, for in the generality of seasons the meadows and pastures fall off so much about this period, as not to afford a competent supply of succulent food for either milch-cows or fat stock; so that turnips, cabbages, or some other similar production, have to be resorted to for beasts that have already become half or three-quarters fat upon the summer's grass, which if neg-

lected at this particular season, the intention of the grazier would be thereby defeated. It also usually happens, that about this period of the year, large quantities of lean stock are bought in for the purpose of winter feeding; and in order to improve their condition before the more severe part of the season comes on, and the hay-stack has to be resorted to, the feed in the old pastures is therefore now bestowed upon the lean portion of the stock, while other means are found to complete the process of fattening. Great numbers of Scotch, Welsh, and other descriptions of hardy cattle are purchased at the distant fairs at this season; many of which are fed upon straw during the winter, and turned into the pastures to fatten on the return of spring, where the farmers find it convenient to do so; or else again sold at the spring fairs to those who occupy suitable lands to graze them upon: the farmers of the arable districts find it advantageous to have their large quantities of straw converted into manure, so that although they may make but little by stock which they buy in the autumn and sell again in the spring, yet by this means they accumulate vast quantities of manure which are of immense value as dressings for the various kinds of crops.

At this season of the year it again becomes necessary that the husbandman should see that his fences are all in good repair, before the young crops spring up, and ere the season be so far advanced as to make hedging and ditching, in many situations, a more difficult matter to perform. Draining and land-ditching should now be performed where the nature of the ground requires it, and may be continued through the winter season, whenever the weather is of a nature to admit of out-door labour; but there are few things that more particularly require the occasional presence of the superintending eye of the master than draining does in the various modes in which it is now practised. Most sorts of labour remain for inspection when the work is finished; but with draining the reverse is the case, for the moment the drain becomes closed and filled up, it becomes impossible to ascertain whether the work has been properly executed or otherwise; so that when the parties employed are not thoroughly trustworthy, it is highly necessary that their work should be inspected as they proceed. In the early part of the month, when the autumnal rains happen not to have come on, the ponds and watercourses may be advantageously cleared out; but as there is always a risk of deferring such matters to so late period, it would be better to attend to these things several weeks earlier in the season. And now, when the storms may be occasionally expected to visit us in our somewhat uncertain climate, the threshing-floor is got ready, and the flails are heard at work, for on many farms threshing is looked upon as a sort of reserved labour, in which persons that are employed constantly upon the farm may be occupied in stormy weather, or when other work fails. The state of the corn-market, however, materially affects the threshing season; and among small and needy farmers their necessities frequently compel them to hurry their crops to market. But the maltsters look for a supply of barley about this season, so that it commonly happens that threshing comes pretty generally into operation. Not, however, that it is so easily performed now as at a later period, for dry frosty weather is the most favourable for the grain being easily separated from the straw. Recently-threshed straw is also more acceptable to cattle than that which has been threshed some time and stowed away.

MONTHLY CALENDAR.—NOVEMBER—Eleventh Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock aft. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h m.		h. m.	h. m.
1 *Su*	306	20 *S. aft. Trin. All Sts.*	6 56	16 17	4 31	7·1	1a30	9a34
2 M	307	All Souls. M. Term beg.	6 58	16 17	4 29	☽	1 49	10 48
3 Tu	308	*Princess Sophia b. 1777.*	6 59	16 17	4 27	9·1	2 5	morn
4 W	309	. . .	7 1	16 16	4 26	10·1	2 19	0 4
5 Th	310	*Gunpowder Plot,* 1605.	7 3	16 14	4 24	11·1	2 31	1 20
6 F	311	. . .	7 5	16 12	4 22	12·1	2 44	2 38
7 S	312	. . .	7 7	16 8	4 21	13·1	2 58	4 0
8 *Su*	313	21 *Sunday after Trinity.*	7 8	16 4	4 19	14·1	3 15	5 25
9 M	314	Lord Mayor's Day.	7 10	15 59	4 17	○	3 38	6 56
10 Tu	315	. . .	7 12	15 53	4 16	16·1	4 11	8 27
11 W	316	St Martin. Half Quart.	7 14	15 46	4 14	17·1	5 0	9 54
12 Th	317	Cam. M. Term div. m.	7 15	15 38	4 13	18·1	6 7	11 4
13 F	318	. . .	7 17	15 30	4 11	19·1	7 28	11 57
14 S	319	. . .	7 19	15 20	4 10	20·1	8 56	0a32
15 *Su*	320	22 *Sunday after Trinity.*	7 21	15 10	4 9	21·1	10 22	0 55
16 M	321	. . .	7 22	14 59	4 7	☾	11 45	1 13
17 Tu	322	. . .	7 24	14 47	4 6	23·1	morn.	1 27
18 W	323	. . .	7 26	14 34	4 5	24·1	1 3	1 40
19 Th	324	. . .	7 27	14 21	4 3	25·1	2 19	1 52
20 F	325	. . .	7 29	14 6	4 2	26·1	3 34	2 4
21 S	326	St. Cecilia.	7 31	13 51	4 1	27·1	4 49	2 18
22 *Su*	327	23 *Sunday after Trinity.*	7 32	13 35	4 0	28·1	6 4	2 36
23 M	328	. . .	7 34	13 18	3 59	29·1	7 19	3 0
24 Tu	329	. . .	7 36	13 0	3 58	●	8 29	3 31
25 W	330	Mich. Term ends.	7 37	12 42	3 57	1·4	9 32	4 13
26 Th	331	. . .	7 39	12 22	3 56	2·4	10 24	5 8
27 F	332	. . .	7 40	12 2	3 55	3·4	11 3	6 11
28 S	333	. . .	7 42	11 42	3 54	4·4	11 32	7 21
29 *Su*	334	*Advent Sunday.*	7 43	11 20	3 54	5·4	11 53	8 34
30 M	335	*St. Andrew.*	7 45	10 59	3 53	6·4	0a10	9 48

Meteorological Averages.

Barometer.	Ins.
Mean height	29·776
Highest .	30·270
Lowest .	29·080
Hygrometer.	°
Mean dew-point	40·5
Highest .	40
Lowest .	25
Mean dryness	2·4
Mean greatest do. of day	4·7
Greatest dryness	14
Thermometer.	
Mean temperature	42·9
Highest	62
Lowest	23
Radiation.	
Mean great. of Sun	6·8
Greatest power	23·5
Mean cold of terrest.	3·6
Greatest ditto	10
	Ins.
Mean qty. of rain	2·400
Mean of evap.	0·770

Table of the Winds.

	Days.	Dew-P.
N. .	3	38°
N.E. .	3	37
E. .	3	40
S.E. .	2	46
S. .	3	48
S.W. .	6	47
W. .	5	42
N.W. .	5	35·5

SUNDAY LESSONS.

Nov.		MORNING.	
1	20	S. aft. Trin.	All Saints: Joel 2. . Heb. 11 v. 33 & 12 to v. 7
8	21	„ Hab. 2	Lu. 24
15	22	„ Pro. 2	John 7
22	23	„ „ 11	„ 14
29	Ad. Sun.	Isa. 1	„ 21
		EVENING.	
Nov.	1	Mic. 6 . . .	Rev 19 to v. 17
	8	Pro. 1	1 Thes. 4.
	15	„ 3	1 Tim. 4.
	22	„ 12	Titus 1.
	29	Isa. 2	Heb. 5.

THE MOON'S CHANGES.

First Quart. 2nd day, 1h. 4m. aft.
Full . . . 9th day. 5h. 52m. aft.
Last Quart. 16th day, 8h. 54m mn.
New . . . 24th day, 2h. 12m. mn.

Day of Mth.	Length of Day.	Day's decrease	Day break.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	16′ 9″
1	9 35	6 59	5 0	6 27	16 10
6	9 17	7 17	5 7	6 20	16 10
11	9 0	7 34	5 14	6 13	16 11
16	8 45	7 49	5 22	6 7	16 12
21	8 30	8 4	5 29	6 2	16 13
26	8 17	8 17	5 36	5 59	16 14

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PEVEREL CASTLE, DERBYSHIRE.

[Peverel Castle, Derbyshire.]

This ancient fortress overlooks one of the most beautiful valleys of that mountainous district of Derbyshire known by the name of the High Peak; a district more interesting for the variety of its scenery and its mineral productions, and for the wonders which nature seems to have there scattered about as it were in sport, than any other perhaps that our country can present. The immediate approach to this valley by the road across the mountains forms a continual descent for about two miles, and runs necessarily in a winding direction, so steep is the declivity. Precipices a thousand feet in height, dark and rugged, rise perpendicularly on each side, and every here and there directly in front, forming apparently an impassable barrier. Through this tortuous chasm the currents of wind appear to be ever striving, with difficulty, to find their way, a circumstance which has given to the spot the happily expressive and poetical appellation of the Winnats, *i.e.* the gates or portals of the winds. At one of the sudden turns of the road to the left, a most beautiful view of the vale opens upon the eye, contrasting its rich pastoral beauty with the wild and barren mountains that shut it in. Its breadth from north to south is probably about two miles, and the length from east to west between five and six miles. Various streams run through the vale, and on the north and south sides we see the mouths of several smaller valleys opening into it. All around are lofty eminences covered even to the very summit with fertile enclosures running one above the other. Westward the hills assume an amphitheatrical form, and in that direction we see the village of Castleton, close to which, below, is the famous Peak's Hole, or Devil's Cave, and above, on the very edge of a perpendicular precipice, is the Castle which forms the subject of our present paper.

From the style of the architecture, and the appearance of herring-bone masonry in a particular part of the walls, King, in his 'Observations on Ancient Castles,' supposes that this fortress was erected by the Saxons; and Pilkington, in his 'History of Derbyshire,' thinks it not improbable that the walls of the area were built by that people, and that the keep was added by the Normans. It is at least "pretty certain," he adds, "that there was some kind of fortification before the Norman conquest, for in Domesday-book "terra castelli" is expressly mentioned. Whatever truth there may be in this opinion, the foundation of the castle is now generally attributed to William Peverel, the natural son of the Conqueror, who, it is certain, received, among his other extensive gifts, a grant of this estate. His family, however, did not long retain their possessions, for a grandson of William Peverel, having poisoned Ranulph, earl of Chester, was obliged to secure his safety by flight, leaving all his estates to the disposal of the king, Henry II. During the absence of Richard I. in Palestine, the castle was placed in the keeping of Hugh de Novant, in accordance with an agreement concluded between Longchamp, bishop of Ely, and John, earl of Morteyne. During the wars between King John and the barons it fell into the hands of the latter, but in 1215, William de Ferrers, 7th earl of Derby, having raised troops for the king, took Peverel Castle by assault, and was appointed its governor in recompense. Among the various individuals who at dif-

ferent times afterwards held this fortress may be mentioned Prince Edward, in the thirty-fifth year of the reign of Henry III., and his great antagonist Simon de Montfort, who held it in the forty-ninth of the same reign. In the fourth of Edward I., John, earl of Warenne, obtained a free grant of the castle and honour of Peka with the whole forest of High Peka, to hold during his life in as full and ample a manner as it was anciently enjoyed by the Peverels before it came by escheat to the crown. In the second of Edward III. the castle and forest appear to have formed part of the marriage portion of Joan, sister of the king, on her union with David, prince of Scotland. In the forty-sixth of Edw. III., they were given to John of Gaunt, and became absorbed in the duchy of Lancaster.

Although, from what we have stated, it appears that the castle has been taken by assault, it seems difficult to perceive how such a result could have taken place had the besieged exhibited but a moderate share of determination and courage in the defence. The castle walls occupy almost the entire summit of the mount, and without these on the east and south sides extends a narrow ravine, in some parts two hundred feet deep; on the west the precipice has a perpendicular fall of about two hundred and sixty feet deep; whilst on the north, which must be considered the only accessible side, the path is carried upwards by a series of traverses, in which a small body of men might with ease stop the progress of an army. At the south-west angle the precipice partially forms the roof of the great cavern (the Peak's Hole) we have mentioned. The entrance to the castle-yard is on the east, and was doubtless originally very strong; the remains are now, however, inconsiderable. The walls are also nearly ruined down to the level of the area, though in some parts they still measure on the outside twenty feet in height. On the north side the wall was defended by two small towers, which were erected also most probably to command what we have stated was the only mode of approach, the ascent on the north side of the hill. Near the south-western corner of the walls we find the keep, which was small but very massive. Its walls on the south and west sides are tolerably entire, and at one part are found on measurement to be not less than fifty-five feet high. On the outside it forms a square of about thirty-eight feet, but in the inside the sides are not equal owing to the varying thickness of the wall, which in some parts amounts to six and in others to eight feet. The wall is composed of broken masses of limestone set in mortar of such excellent temper that the whole has amalgamated into a substance hard as rock. The facings both within and without are of hewn gritstone. In the wall within is the herring-bone ornament we have alluded to. The inside of the keep is now a mere blank. It originally consisted of two rooms, the lower of which appears to have had no separate entrance, but was reached by a flight of steps (now gone) from the upper. The lower room was about fourteen feet high, the upper sixteen. The roof was raised with a gable end to the north and south, and was covered with lead. The principal entrance into the keep was through a noble portal on the south side of the upper room, and which King supposes was reached by a platform attached to the wall without. At the south-east corner of the keep is a narrow winding staircase originally communicating with the roof, but now in a ruinous condition. We must not omit to observe that in the eastern wall of the upper apartment is a kind of recess of a rectangular figure with a singular canopy. King indulges in some fanciful conjectures respecting this recess; supposing it to have been in Saxon times the place of an idol. It has been observed that although this castle was almost impregnable owing to its situation, yet that it was but ill adapted for a procrastinated siege on account of the want of water; there being no appearance of well or reservoir within its walls. But King considers, and we think justly (for in the present ruinous condition of the castle it is impossible to make any accurate and satisfactory search), "that no one acquainted with this kind of buildings can have any doubt as to there once having been a well in the tower." It may be added too, that in recent years a well with an ample supply of water has been discovered on the summit of Long Cliffe Hill, between which and the castle there is a communication, though now a very dangerous one, across the narrow ridge of rock that overtops the entrance into Peak's Hole. In the history of Peverel Castle there is a romantic incident, recorded in the following words by Pilkington:—During the time the castle was possessed by the Peverels, "a tournament was held here. It was occasioned by the following circumstance, which strongly marks the gallantry of the times when it happened. William, a valiant knight, and sister's son to Pain Peverel, lord of Whittington in the county of Salop, had two daughters, one of whom, called Mellet, was no less distinguished by a martial spirit than her father. This appeared from the declaration which she made respecting the choice of a husband. She firmly resolved to marry none but a knight of great prowess; and her father, to confirm her purpose and to procure and encourage a number of suitors, invited all noble young men who were inclined to enter the lists to meet at Peverel's place in the Peke, and there decide their pretensions by the use of arms; declaring at the same time that whoever vanquished his competitors should receive his daughter with his castle of Whittington as the reward of his skill and valour. Guarine de Meez, a branch of the house of Lorraine, and an ancestor of the lords Fitzwarrine, hearing of this report, repaired to the place above mentioned. He had a silver shield with a peacock for his crest, and there engaged with a son of the king of Scotland, and also with a baron of Burgoyne, and, vanquishing them both, obtained the prize for which he sought."* But the strongest moral interest that has been thrown around it, has arisen from its having given its title to, and formed the scene of a considerable portion of the events of one of Sir Walter Scott's most popular novels.

We have already given, in No. 131, an account, with a view and plan, of the cavern of the Peak, and can only mention here that between one and two miles from Castleton is the eminence called Mam Tor, or the Shivering Mountain, which derives its former appellation from the ancient Britons, and the latter from the circumstance that the *shale* of which it partially consists, being decomposed on the surface by the action of the atmosphere, is continually shivering as it were into fragments, and falling into the valley below, which for the extent of half a mile from the base is covered with it; and that near the bottom of Mam Tor is a very ancient lead-mine known as the mine of Odin, which has probably been worked from the Roman times. We have given a description of the Roman pigs of lead found in the neighbourhood of this mine, in No. 303. It still furnishes employment to about 140 persons.

VITTORIO ALFIERI.

THE name of Vittorio Alfieri, one of the greatest Italian poets in the last century, can hardly be new to the greatest number of our readers. His life was written by himself, in a concise, vigorous, and disdainful style, such as indelibly characterises every line of his works. It is one of the most striking portraits that any artist ever left of himself. That life is an eminently moral book, in so far as it represents a mind growing up, abandoned to itself, unknown, stagnating in ignorance and inertia almost to the end of youth, then roused all at once by a sudden start, and travelling on the path of immortality with a confidence in his own forces and with a firmness of purpose which would be controlled by no obstacle.

From that interesting autobiography, which, together

* Pilkington's 'Derbyshire,' vol. ii., p. 397.

with the best part of Alfieri's works, has been rendered into English by Mr. Lloyd in 1811, we draw the following biographical notice:—"In the city of Asti, in Piedmont," the author says, "in 1749, I was born of *noble*, *wealthy*, and *honest* parents. These three circumstances I have noted, because I consider them highly favourable to me for the following reasons:—that I belonged by birth to the nobility was of great avail to me, as I could thus unveil all the abuses and disorders of that class without incurring the charge of envy or malignity; to have been born rich secured my independence, and afforded me the means of serving none but truth; and the honesty of my parents gave me no occasion of blushing that they were noble."

Alfieri was left an orphan from his childhood. His mother was remarried, and he was trusted to the care of a guardian, who sent him to an academy in Turin, where he underwent eight years of what he calls *non-education*. At the end of his minority he was thrown alone into the world with a large fortune, but no safeguard except the loose ideas of honour prevailing at the time, and a proud mind that seemed unconsciously to aim at great undertakings and panted for action in a different sphere of life.

In his twenty-sixth year he was in love (it was not the first time nor the last) with a lady no longer young nor beautiful, to whom he was attached only on account of her character, which was as proud and irascible as his own. His lady having fallen seriously ill, the condescending cavalier resigned himself to attend upon her in her drawing-room, for many hours without stirring or breathing. A martyr of gallantry and a victim of *ennui*, he was tempted for the first time to scribble, without design, a few verses in the shape of a dialogue between two imaginary personages, to which other scenes were successively added, until it swelled into a tragedy, and was called 'Antonio e Cleopatra.' The lady recovered, and Cleopatra was forgotten under the cushion of her easy-chair, where the lady having found, read, and admired it; it was produced before a circle of friends, and finally, by unanimous encouragement, ventured upon the stage. Notwithstanding the astonishing success it met with at the theatre, Alfieri was not blind to the real imperfections of that premature performance. Yet among his dissipations a new thought began to haunt him, a vague regret for the time he had lost, an anxious longing for fame, which sickened him of his juvenile pleasures, and allowed him no rest until he arrived at the determination to be a tragic poet.

To become a tragic poet in his age, according to the cramped ideas prevailing in his classical country, implied more difficulty than could be at present imagined, and tragedy was the last task that a scholar would have dared to attempt. Of the rules of this art Alfieri knew nothing. He had had in his hands the libretto of some of Metastasio's operas, and some foreign tragedies, when he attended the theatre, which he never did unless it were to join a merry company or to pursue an intrigue. Moreover he had hardly ever heard or spoken any language but the French of the court or the Piedmontese dialect, still more unlike Italian than the French itself. Of Italian, Latin, or Greek he knew next to nothing.

Still tormented by that disease of noble minds, fame, and grounding his hopes on what he calls his "determined, obstinate, indomitable nature," at the age of twenty-nine he resumed his long-abandoned studies, and began his poetical career by an elementary course of grammar. Without the aid of a teacher, surrounded with grammars and dictionaries, he undertook several journeys, with the object of visiting the birth-places or the tombs of his great Italian predecessors, drawing his inspirations from the memory of the dead. His tragedies now followed each other with surprising rapidity, and with them love poems, essays in verse and prose, and subsequently satires and comedies. His studies were far from engrossing all his time, and, as it generally happens with very superior minds, he found time for all his different pursuits, being at once a schoolboy and an author, a traveller and an amateur actor, a misanthrope, an apostle of virtue and liberty, a warm friend, a passionate lover, a skilful fencer, and a desperate rider.

In order better to secure his independence, he made a donation of his fortune to his sister, and lived on a moderate annuity; he threw off his king's uniform, and settled successively at Florence, Rome, and Sienna, to which he was attracted by the peculiar softness and elegance of the popular dialect.

He undertook several journeys to France, Holland, and Germany, and was twice in England, where he distinguished himself in his early age for his extravagant fondness for horses, for his dashing appearance, driving four-in-hand, and by some rather bold than laudable exploits. He always expressed in strong terms his admiration for this country. "He loved England," he said, "almost as well as Italy, because in England a wise and equitable government has subdued, or at least compensated for the disadvantages of a stubborn and unyielding nature; whilst in Italy, nature has always contrived to come off conqueror of its often wicked and always improvident governments." As he loved England and the English, whom he calls a good and good-natured people, so did he, in his 'Misogallo,' violently express his dislike of the French, and often, it must be confessed, in exaggerated and undignified terms. This feeling of aversion, which seemed innate in his bosom, was exasperated by the ill-treatment he met with at Paris, where he resided during the first storms of the Revolution of 1789, and where, although a well-known partisan and advocate of civil liberty, he was traced out by the raving multitude and hunted down as an aristocrat during the horrors of the fatal 10th of August, 1792, and almost obliged to fight his way through the mob-besieged gates of that distracted metropolis.

He had, several years before that time, bestowed his affections on a foreign lady of high rank, the Duchess Louisa Stolberg of Albany, who had been the consort of the last prince of the house of Stuart. After his return from Paris he settled at Florence with her, and during the French domination in the country, he shut his door against every kind of intrusion, and whenever French generals or members of the Parisian Institute called upon him, his answer was, that "Vittorio Alfieri was too far advanced in age to make new acquaintances."

In his forty-eighth year he first thought of studying Greek, and, with his wonted indefatigableness, in a few months made himself proficient in that language. Between such studies and the company of his lady he was very seldom seen out of doors; whenever it happened, he was seen alone, walking slowly, in the most lonely paths of Lung'arno, far from the public promenade, far from the sight and company of men. He died in 1803. The works of Alfieri form a collection of twenty-four volumes. Besides his twenty-two tragedies, by which he gave life to the Italian stage, he left six comedies, some political treatises, a translation of Virgil, Sallust, and Terence, with a few volumes of lyrical poems.

Alfieri had very lofty ideas of the duties of poetry; he had exalted notions of the dignity of man; he had an ardent, though a vague and not very consistent love of true liberty and of the noble virtues to which it gives birth. As soon as the wild predilections of his youth began to be calmed, and he first dreamed of glory, his verses were tuned to ennoble the human race and reform the character of his countrymen. He perceived that of all branches of literature the theatre is likely to have the most direct influence on the uneducated masses of the people. Attacking, therefore, effeminacy in front, which he considered as a social crime, he endeavoured to dethrone Metastasio, the idol of the multitude; to substitute dramatic for melodious poetry, manly passions for effe-

vating affections, ideas for sounds. He wanted to effect upon his countrymen that revolution which he had himself undergone; he wanted to form a thinking, stirring, willing, resisting nation, to wake them up, to make them conscious of their utter degeneration. The influence, in fact, that his dramas exerted, and still exercise on every class of people in Italy, is to be considered as one of the principal causes of that political discontent that has been thus far productive of a vain and disastrous struggle, but which may perchance prepare that country for a better future.

Alfieri was a rigid observer of dramatic unity, and modelled his tragedies after the standard of the Greek drama. He therefore belongs, by his form, to the classics, but his manner of writing is his own, and few poets ever displayed more true originality of genius. His principal faults consist in a uniformity and infecundity of plan and character, abstraction from all circumstances of time and place, as well as of manners and customs, want of action, frequency and length of monologues, exaggeration of virtue and vice, harshness and obscurity of style. Wherever be the scene, whoever the hero, it is always the poet that speaks; it is always his proud lofty soul reproduced under various shapes; it is always the same object, of which he never loses sight, to which he makes everything else subservient,—the reformation of morals in his country.

His Countess erected in his honour a fine monument in marble, at Santa Croce in Florence, the work of Canova. It consists of a group of statues, representing Italy as a mourner on the tomb of her gifted tragedian.

QUEEN ANNE'S FARTHINGS.

[Complete Set of Queen Anne's Farthings.]

A very general belief exists that one of Queen Anne's farthings is as good as a little fortune to the possessor. This is by no means the case, and when it is seen that there are types of not fewer than seven of these pieces of money of Queen Anne's reign, it is not likely that they should all be extremely rare; and even the scarcest of all our coins do not fetch the large sums which it is supposed a Queen Anne's farthing would bring. Mr. Akerman notices incidentally, in his 'Numismatic Manual,' the prices which collectors occasionally give at public sales for coins of great rarity. The rial of Queen Mary, intrinsically worth 20*s*., has sold for 63*l*.; the rial of her sister Elizabeth, for 21*l*. 10*d*. A penny of Stephen's reign, bearing an impression of a horseman's mace, has sold for 13*l*.; the groat of Edward II., for 5*l*. 15*s*. The Canterbury penny of Richard III., supposed to be unique, sold at a public sale for 7*l*. 10*s*.; and the Durham penny of the same king, for 4*l*. 4*s*. A half-groat, supposed to have been coined by the Duchess of Burgundy, for Perkin Warbeck, when he set out to invade England, has been sold at an auction for 21*l*.; the groat of Henry VII., with 'Henric Septem' inscribed on it, fetched 10*l*. 15*s*. 6*d*.; and the penny of the same king, with the arched crown upon it, 6*l*. 8*s*. 6*d*. The twenty-shilling piece of Charles I., which is much esteemed by collectors, is considered worth about 18*l*. or 19*l*. It is only since the reign of Henry VII. that the portraits on English coins have any pretensions to be regarded as likenesses of the sovereign. Coins which are the most rare are not unfrequently fabricated for the purpose of being sold to those who profess a taste for numismatics; but the study of genuine collections will be the best safeguard against such impositions.

The rarest of Queen Anne's farthings is not so highly esteemed as some of the coins above mentioned, the price of which we have given. The pattern farthings of the Protectorate are more highly valued than those of Queen Anne, with the exception, perhaps, of the one with Peace in a car drawn by two horses, and bearing the legend, 'Pax missa orbem.' Next in point of rarity is the one representing Britannia under an arch. The pattern farthings with the date of 1713 and 1714 are also rare; and this is the case, though in a somewhat less degree, with the common current farthings of Queen Anne.

The second, third, and last of the series in the woodcut were never current. They were coined in consequence of a plan which Swift had projected for a re-coinage of half-pence and farthings, which should bear devices and inscriptions, like medals, in allusion to the most remarkable events of the reign of Queen Anne. The lord treasurer favoured the plan; but nothing, says Ruding, was done beyond striking a few pattern half-pence and farthings.

The Saxons had a silver coin of the value of the fourth part of a penny, called a *feorthing*. The precious metals were much scarcer at that time than in the present day; but as commerce increased and population advanced, the value of money and of commodities became in some measure reversed, and after the reign of Edward IV. (1461-1483), the quantity of silver which was represented by the fourth part of a penny was so small as to render it expedient to discontinue the coinage of silver farthings. In the reign of George II. the silver penny experienced the same fate. Copper farthings were first coined in the reign of James I. There appears to have been at that time great difficulty in carrying on the daily traffic for articles of little value, in consequence of the want of coins of a small denomination; and tradesmen were under the necessity of striking what were called farthing tokens in lead. Sir Robert Cotton, writing in 1612 in recommendation of a coinage of small monies, states that there were in London above three thousand persons who on an average issued their leaden tokens to the amount of 5*l.* annually, "whereof," he remarks, "the tenth remained not unto them at the year's end, when they renewed their store;" and he estimated the rest of the realm not to be inferior to the city in proportion. It appears that the tokens, small as was their value, were counterfeited, and sometimes the death or removal of those who issued them occasioned a loss to the public. To put an end to these evils, this illegitimate coin was abolished by a proclamation in 1613, which states that the farthing tokens passed between vintners, tapsters, chandlers, bakers, and others, "whereby such small portions and quantities of things vendible as the necessity and use, especially of the poorer sort of people, oftentimes required, might be conveniently bought and sold without enforcement to buy more than would serve for their use and occasion;" and the king therefore granted letters-patent to Lord Harrington to make farthing tokens of copper; for this privilege James was to be paid 20,000*l.* in the course of three years. The new coin was circulated with great difficulty, and in several counties was absolutely refused.

There has been a plentiful coinage of farthings during the last few years, much to the satisfaction of small purchasers. From 1834 to 1837 inclusive, above 8000*l.* were coined in farthings. The amount which may be coined in farthings from a ton of copper is 224*l.*, or 215,040 farthings. Half-farthings are occasionally coined for some of the colonies.

CUSTOMS AND SUPERSTITIONS AMONG THE ESTHONIANS.

The baptismal rites are much the same as those customary in other Protestant churches, the only exception is that they resort to the singular practice of threading a number of little balls of metal, which contain asafœtida, and hanging them by way of necklace round the infant's neck. It is their firm belief that this charm is conducive to the child's health and well-being. In fact, there are few who do not wear a lump of asafœtida next their hearts until they are borne to their graves. Their customs with respect to deaths and burials much resemble what are observed among others of their northern neighbours. They harangue the dead, like the Russian peasantry, and ask their relative, "Why he has not remained longer among them?" "Whether he was not pleased with his oatmeal 'puddro,' or 'porridge?'" "Whether he would never pay another visit to his bathing-room?" (for this last is one of their darling enjoyments). Victuals are laid by the dead man's side, in order that he may not starve on his way to heaven. They also hold a wake, on which occasion every one places food on his relative's grave: but neither the Esthonians nor the Russians put on mourning. The wife betokens the death of her husband, however, by wearing her 'preese' or stomacher for awhile turned upside-down: and at every funeral a nail is driven into the threshold. There is something out of the common way in the sight of an Esthonian funeral procession in winter: the corpse is deposited in a sledge, the women follow it in sledges also, and the men accompanying the train on horseback: all making their way over the snow in double-quick time.

There are no customs among this people more invariable or peculiar than those which belong to marriage and its antecedents. The girls consider marriage the one great object to be courted, attained, and prepared for from the earliest dawn of their susceptibilities. They spin and weave at their outfit, frequently for ten years before their helpmate is forthcoming: this outfit extends to a whole wardrobe full of kerchiefs, gloves, stockings, &c. When they have formed an acquaintance to their liking—the occasion having been usually of their own creating—they look forward with impatience to the moment of the proposal being made. But there is one season only—the period of the new moon—when an offer can be tendered; nor is any time so much preferred for a marriage as the period of the full moon. The plenipos in the business of an offer are generally a couple of the suitor's friends, or else his parents, who enter the maid's homestead with mead and brandy in their hands. On their approach the gentle maiden conceals herself, warning having been given her in due form by some antient dame; the plenipos never make a direct announcement of the purpose of their mission, but in most cases tell the girl's parents some story about a lamb or an ewe which has got astray, and they desire to bring home again. The parents immediately invite them to drink, vowing that they know nothing of the stray beast; if they decline to drink with them, it is a sign either that they have no inclination for the match, or that their daughter has whispered them, "her heart has no room for the youth in question." But if all are of one mind, the parents set merrily to work on the mead and brandy, and give the suitor's envoys free licence to hunt out the stray lambkin. When caught, she is also expected to taste of the merry cup, and from that moment the bridegroom becomes at liberty to visit his bride. He makes his appearance, therefore, a few days afterwards, bringing presents of all kinds with him, together with a ring, which he places on the maiden's finger as his betrothed.

The parties so agreed then apply to the proprietor of the estate for his approbation of their union, and to the clergyman to tie the knot. In urging their suit to either, the old and prescribed story of the lost lamb is duly put forward as a preamble. On the nuptial day the bridegroom, attended by all his friends, either on horseback or in sledges, proceeds at full gallop to the church. The 'pejepois,' or bridegroom's herald, rides in advance of the troop, and as they pass by any sacred spot, lake, spring, or oak, they make a halt and leave some small present behind them as a means of enlisting all "good spirits" in charge of the hallowed precincts, in their favour. The bride makes her way to the church under similar circumstances. The marriage rites being over, both retinues proceed to the bride's home; the 'pejepois' galloping before, decorated with flowers and long white ribbons, and the bridegroom's sledge following him, with a bagpiper ensconced beside the coachman. Upon their arrival, the pejepois rides three times round the house, and salutes the roof with as many blows of his naked sword. The female friends of the bride next lustrate the

horse which draws the bride and bridegroom's sledge, by emptying a can of mead or beer over his head, and salute the twain with throwing a handful of rye over them. After the repast that follows, the bridegroom treads his own and the bride's spoon under foot, and the remainder of the day is passed in dancing and singing, masquerading, and all sorts of revelry.*

The sledges are brought up the next morning to conduct the bride to the bridegroom's dwelling. Her dower is stowed away in them, and she follows them herself, wrapped up in cloths and kerchiefs, for the purpose of concealing her emotion and tears upon taking leave. Her brother, if she has one, plays the part of her coachman; the 'pejepois,' amidst the bantering of all around, rides three times round each sledge, and the train sets forwards for its destination. The first ceremony on reaching it is to dress the bride, for which purpose she seats herself in her brother's lap, and while her mother is busy combing and dressing her hair, and adjusting the wife's cap to her head, the rest of the party dance and joke, and jump round her. In most cases it is the custom to throw a child into her lap; she nurses it in her arms during the ceremony, and on parting makes it a present of a pair of stockings. Her mother, or else one of the fair maids present, also repeats some lines of poetry during the process of dressing her head, ending in the following not very exhilarating lines:—

> "Bind the band of care, and sow
> The braid of sorrow round thy brow,
> And cloth of wailing on thy head."

After this custom is completed, the 'pejepois' places the bridegroom's hat three times on her head, and three times she throws it off, taking care, however, to catch it as it falls, as a sign that, although she protests against her helpmate's supremacy, she is yet disposed to put up with it. This interlude closes by the 'pejepois' giving her a gentle slap on the cheek, to remind her of the husband's right to command. The bride then apportions the store, which she has spent so many years in amassing, among those present; stockings, gloves, kerchiefs, &c. fly in all directions, and are met by promises to send her bee-hives, sheep, and cattle in return; these promises are faithfully kept either sooner or later. In the evening the bride is expected to dance once with every male guest, and each makes her some small present in money as an acknowledgement for the favour.

On the morning after the bridal night, which is usually celebrated in the store-room, the lass is carried all over the house, preceded by the bagpiper, and she is required, as a commencement of her household duties, to clean out the stove.

Though the Esthonians have for ages been Christians, and are now of the Lutheran faith, there is still so much of their earlier paganism clinging to them, that their new profession, instead of having expelled it, is become a mere cloak or mask for it: they were not so much idolaters as worshippers of magic and enchantment—slaves to the shaman, or magician. And at this hour there is undoubtedly no community of Lutherans to be found elsewhere who entertain so sincere a feeling of veneration for the arts of magic, ghost-seeing, and every other superstition peculiar to an unconverted people. The trees, caverns, groves, and hills which their heathen forefathers accounted sacred, are especially so among their present posterity: hither they bring their Easter gifts of sticks, branches, and garlands, in some cases, and meats, coins, &c., in others; independently of observing the same custom on occasion of marriages and burials. They venerate certain trees as the abodes of great and powerful sprites, and to such an extent, that they will not allow a single berry or flower to be picked which grows beneath their shade, much less allow a branch to be broken off from them. The German colonists have for these five centuries past been endeavouring to fell or root up every such tree, but what they have destroyed has constantly been succeeded by some new tree of holy character; whence it would seem that the sprites are in the habit of changing their abiding places. The Esthonians have a secret dislike for all spots consecrated by Christian pastors, and, where they can have their own way, prefer burying their dead in woods or wildernesses of their own selection to depositing them in regular churchyards. They see the 'Kurrar,' or evil spirit, at work in every nook and corner, and it is by no means uncommon for the whole peasantry of a village to arm themselves with scythes, flails, and whips for the purpose of driving him out. All is uproar and confusion as soon as it is rumoured that "the devil is paying them a visit:" they lose no time in taking the field against him, and, laying hold of some unfortunate cat or wolf, as his hiding-beast, cudgel and whip him out of the village. I have known them even boast that they had killed the devil; they believe him part and parcel of tempests and whirlwinds, and frequently run after the latter, throwing sticks and stones at the dust they create. There is a whole army of black days in their calendar. Thursday is commonly looked upon as an unlucky day, and for this reason they never set about any business of moment upon it; nor do they ever shoe a horse at the full of the moon. No wood is felled on the 23rd of April, the day on which the wolves make their meal of all woodcutters. They never point at the moon with their finger, because, if they did, that finger would not turn to dust. Many things are possessed of charms in the Esthonian's eyes, especially asafœtida, probably on account of its strong smell; and even the Word of God, as explained by their Protestant pastors, is valued only for the wonder-working or magic virtue inherent in it.

Among other superstitions, they shake off, by throwing it upon the moon, every calamity which may befal them for a month to come, and with this intent thus address the new moon:—"Hail to thee, new moon! Let me be young, and thou old; let mine eyes be clear, and thine dim; let me be light as a bird, and thou heavy as iron!" (Compiled from *J. G. Kohl's Reminiscences*.)

* Many of these ceremonies greatly resemble the proceedings on similar occasions in Bretagne, as described in Bentley's 'Miscellany' for October, 1840.

DOMESTIC CHEMISTRY.—X.

SUGAR.

Surprise was very generally excited at the announcement made some years ago by a distinguished philosopher, that "linen rags were capable of producing more than their own weight of sugar, by the simple agency of one of the cheapest and most abundant acids." This fact had long been known to the chemist; but the announcement of it in a popular form was received with the surprise which usually accompanies novelty. Few persons, however, inquired into the means of effecting this seeming impossibility. Sugar continued to be supplied by the grocer instead of the rag-merchant, and the circumstance was gradually forgotten. But the wonder which such an announcement is calculated to excite will cease, if the reader will follow us in the consideration of a few general principles which help to form the basis of chemical science, and which relate as much to linen rags as to sugar-canes; this consideration may be prefaced by a re-perusal of what has been already said on the constitution of organic matter in a former article of this series. ('Penny Magazine,' No. 381.)

In the paper just alluded to, we distinguished between ultimate and proximate elements, and stated that of the fifty-four simple substances which constitute matter of every kind, only four enter into the composition of organic products, viz. oxygen, hydrogen, nitrogen, and carbon. Now, although the practical difference between an animal

and a vegetable is strongly marked, yet an inquiry into their composition will make it difficult to decide where the vegetable begins and the animal ends. As a general rule it may be stated that the ultimate elements of vegetables consist of oxygen, hydrogen, and carbon; while those of animals contain, in addition to these three simple bodies, a fourth, viz. nitrogen. There are, however, some vegetable substances which contain nitrogen; and some animal substances which contain none; so that the distinction has none of that completeness and comprehensiveness so characteristic of a natural law. There are also several other principles existing in minute quantity in animals and vegetables, but which do not seem so essential to the existence of organic matter as the four constituent elements above named. Thus we find sulphur, phosphorus, potassium, sodium, calcium, magnesium, &c. in organic products; but as they occur, as it were, incidentally, they do not disturb the general results to which chemists have brought organic matter.

Supposing then, that a vegetable or animal body is resolved by chemical means into four ultimate elements; that sugar and wheat-flour, for example, are each resolved into certain quantities of oxygen, hydrogen, and carbon; why, it may be asked, do we not take these three elements, which exist in such abundance, and from them form the compounds which we call sugar and flour? This is a very natural question; and the answer to it is instructive.

It is the highest excellence of art so to imitate the beautiful productions of nature, that the art which effected the imitation shall not obtrude itself upon the beholder; but every one will admit that the work of the artist, however accomplished he may be, is very far inferior to those perfect models which nature offers to his study. He can imitate the forms, the colours, and the general aspects of objects; but he cannot confer on them those mysterious properties which constitute vitality. So also with the chemist: he can study nature and watch her proceedings, and by slow degrees understand the wonderful methods by which she operates; but he cannot do her work: he can undo what she has done, and examine most of the materials with which she works; but he is ignorant of the wondrous powers by which, with such simple and apparently limited means, the vast assemblage of organic substances is produced. Indeed our inability to recombine the elements of an organic product is so marked, that the general conclusion as to its ultimate constitution was long supposed to be erroneous; whereas the cause of failure was our ignorance of the mode of combination. Thus, sugar is, strange as it may seem, known to be a compound of charcoal and water; but the reason why we cannot make sugar by the artificial union of charcoal and water, is because we cannot command the circumstances under which those materials come into contact in the natural mechanism of the sugar-cane.

The case is very different with respect to inorganic matter. The constitution of a vast assemblage of inorganic bodies can be distinctly proved by composition as well as by analysis—the most perfect method of proof that can be offered. For instance, we know that water is formed of certain proportions of oxygen and hydrogen, both by analyzing it, and by forming water from those elements. But when it is required to determine the elements of a vegetable or animal substance, we can, generally speaking, only do so by one of these methods. It is known that gelatine (animal jelly) has the same ultimate elements as carbonate of ammonia; because this salt can be produced from gelatine, but gelatine cannot be made from the salt. An organic substance cannot be made by man from inorganic materials.

It is, however, important to observe (and it is to this point that our attention is here directed), that although the attempts to make an organic substance from inorganic materials have failed, yet one organic substance can often be made to assume the characteristic forms of another. A reader might not be more surprised were it said that sugar could be made from a mineral salt than from linen rags; but the possibility of producing it from the latter, and not from the former, is rendered clear to the chemist, because linen is already an organic substance, whereas the salt is not, and because different organic substances differ but little in the proportions of the elements from which they are formed. No substances are more dissimilar than starch, gum, sugar, and vinegar: the first tasteless and almost insoluble, the second tasteless and soluble, the third sweet and soluble, and the fourth a powerful acid. Yet these substances are almost identical in composition. It was once supposed that similar ingredients in similar proportions always produce similarity of qualities; but it is now known that in addition to the quantity and quality of the ingredients, their peculiar mode of combination must not be forgotten. This is known as a truth, but future discoveries must determine why two or more substances so nearly allied in their composition should exhibit such essentially different qualities. The similarity in composition in starch, gum, sugar, and vinegar, enables the chemist to convert one of these substances into the other: not at random certainly, but by proceeding in a certain order. By the process of fermentation vinegar can be procured from sugar: but the reverse of this, *i.e.* obtaining sugar from vinegar, is impracticable.

We shall now be in a condition to understand how sugar may be obtained from linen rags, by remarking that linen contains a vegetable principle nearly-allied to sugar in its elements, and capable of assuming the form of sugar. This vegetable principle is called *lignin*, or woody fibre, and forms an important item in all vegetable food. It assumes a great variety of appearances in different plants; forming the skeleton, as it were, of trees, fruits, and vegetables. It exists in a variety of manufactured articles, such as canvas, cotton, linen, paper, &c.; but however diversified its form and appearance, we have the high authority of Dr. Prout for the assertion, that "in all those plants in which it has yet been examined, it has been found to possess very nearly the same composition; or to consist of equal weights of water and of carbon."

This *lignin*, then, is the vegetable substance whence an article of food may be produced; but our means of production are rude indeed when compared with the refined operation of nature. Lignin in any form, such as sawdust, linen rags, &c., if cleansed from the resin, extractive matter, &c. which pertain to them, and rubbed up with sulphuric acid; and if this acid be afterwards neutralized by the addition of an alkali; it will be found that the wood or the linen has been converted into a species of gum. By boiling this gum for some hours in water slightly acidulated by sulphuric acid, it becomes converted into sugar. This experiment forms only one of the results of an inquiry instituted many years ago in France, on the convertibility of one vegetable substance into another; and as a certain weight of linen rags was actually converted into a greater weight of sugar, we will describe the process, as given by M. Braconnet in the 'Annales de Chimie et de Physique.'

Twenty-four grammes* of old linen rags are selected, dried thoroughly, cut into small pieces, and put into a glass mortar; thirty-four grammes of concentrated sulphuric acid are added, taking care to add it by degrees, and to stir up the mixture continually with a glass pestle: this care is required lest the rags should be blackened and the mixture heated. After a quarter of an hour's repose, the mixture must be worked up with the pestle,

* A gramme is a French weight equal to about 15½ English Troy grains.

and the rags will entirely disappear without any disengagement of gas; leaving a mucilaginous mass, which is very tenacious, pungent, homogeneous, scarcely coloured, and entirely soluble in water, except a small quantity of vegetbale tissue not acted on. In order to free this mucilaginous or gummy substance from acid, the contents of the mortar are dissolved in water, and chalk is added in sufficicnt quantity to saturate the whole of the acid; thus forming a solid sulphatc of lime, which can be entirely removed by prcssing the mixture through a linen cloth. A quantity of watcr is thrown upon the solid contained in the linen; and it is again pressed strongly. The liquor is now reduced by evaporation, and means are adopted to free it from every particle of chalk; by evaporation the liquid assumes the appearance of an insoluble gum. But in order to obtain sugar, it is not in the first instance necessary to separate the acid from the gummy substance. Whcn the rags are fairly dissolved by the acid, the solution, diluted with water, is boiled for ten hours, by which, instead of gum, we have sugar in the form of syrup. The free acid is then ncutralized as above described; thc liquor is filtered, and evaporated until the syrup is thick. In twenty-four hours crystals begin to appear; and in the space of some days a mass of solid sugar is obtained. By redissolving and recrystallizing, it can be obtained purc, and may even be obtained of snowy whiteness.

M. Braconnet, by the above process, obtained 23·3 grammes of sugar from 20·4 grammes of dry linen rags; the sugar thus obtained possessing all the propertics of grape sugar. The reader will therefore now understand that linen rags can be converted into sugar, bccause the *lignin* contained in them consists of precisely the samc elements as occur in sugar. The only actiou of the sulphuric acid is to bring about that change in the proportions and mode of combination of the elements of liquor which will produce sugar.

Our object in this paper is not to teach the reader how to make his own sugar, and thereby dispense with the services of the groccr, but to show what is the nature of that substance, and by describing the mode of its production from linen rags, to illustrate its intimate connection with other vegetable products, to which it appears to have so little analogy. Thesc dctails will tend to lessen surprise, if, at any future time, sugar should be produced from substances still less resembling it, to common eyes, than linen rags. For an account of the preparation of sugar from the sugar-cane we must refer the rcader to an early number (4) of this work.

All Difficulties may be overcome.—There are few difficulties that hold out against real attacks: they fly, like the visible horizon, before those who advance. A passionate desire and unwearied will can perform impossibilities, or what seem to be such to the old and feeble. If we do but go on, some unseen path will open upon the hills. We must not allow ourselves to be discouraged by the apparent disproportion between the result of the single efforts and the magnitude of the obstacles to be encountered. Nothing good or great is to be obtained without courage and industry; but courage and industry might have sunk in despair, and the world must have remained unornamented and unimproved, if men had nicely compared the effect of a single stroke of the chisel with the pyramid to be raised, or of a single impression of the spade with the mountain to be levelled. All exertion, too, is in itself delightful, and active amusements seldom tire us. Helvetius owns that he could hardly listen to a concert for two hours, though he could play on an instrument all day long. The chase, we know, has always been the favourite amusement of kings and nobles. Not only fame and fortune, but pleasure is to be earned. Efforts, it must not be forgotten, are as indispensable as desires. The globe is not to be circumna igated by one wind. We should never do nothing. "It is better to wear out than to rust out," says Bishop Cumberland. "There will be time enough to repose in the grave," said Nicole to Pascal. In truth, the proper rest for man is change of occupation. As a young man, you should be mindful of the unspeakable importance of early industry, since in youth habits are easily formed, and there is time to recover from defects. An Italian sonnet, justly as well as elegantly, compares procrastination to the folly of a traveller who pursues a brook till it widens into a river, and is lost in the sea. The toils as well as risks of an active life are commonly overrated; so much may be done by the diligent use of ordinary opportunities,—but they must not always be waited for. We must not only strike the iron while it is hot, but till "it is made hot." Herschel, the great astronomer, declares that 90 or 100 hours, clear enough for observations, cannot be called an unproductive year. The lazy, the dissipated, and the fearful should patiently see the active and the bold pass them in the course. They must bring down their pretensions to the level of their talents. Those who have not energy to work must learn to be humble, and should not vainly hope to unite the incompatible enjoyments of indolence and enterprise, of ambition and self-indulgence. I trust that my young friends will never attempt to reconcile them.—*Sharp's Letters and Essays.*

Agriculture of Tuscany.—The Mezzeria System.—The opinions of Sismondi in favour of the mezzeria system are well known; and from conversations I had with him in Tuscany, I am aware these opinions have been strengthened by time and experience. He has, however, perhaps rather looked at the question as a philanthropist, seeking the results of his theories in the content and happiness of the labouring poor, than as a political economist who makes the national wealth the main topic of inquiry. But there is a point of view, it seems to me, which has not excited sufficient attention—this is, the universal isolation of the peasantry, which is a necessary consequence of the mezzeria system. Where there is no association, there must be much ignorance. Every peasant's family in Tuscany stands as it were alone: this is indeed a great security for the public tranquillity purchased at a fearful price—at the price of a stationary and backward civilization. I do not conceive how education can break down the barriers which surround every contadino family. I had occasion more than once to see four generations inhabiting the same cottage; but the last had not added a particle of knowledge to the ignorance of the first; the same gross superstitions, the same prejudices against books, the same unwillingness to introduce any species of improvement in husbandry, the same references to ancestral usages. In innumerable cases families have occupied the same farms for hundreds of years, without adding a farthing to their wealth, or a fragment to their knowledge. I once asked a grey-headed peasant how long he and his ancestors had lived in the same cottage. "Non c' è memoria," was his answer—"It is beyond memory." It may be argued that if the contadini do not rise to wealth, they seldom sink to poverty. Is then perpetual toil, which allows of no cultivation to the mind—of no saving for the bodily wants—a fit condition for the mass of peasantry of a most fertile country, a peasantry which possesses (in some sort) as a recompense for their labour a prescriptive right to half the produce of the soil? But, after all, can the system be changed? Certainly not by direct or violent legislation, nor by individual efforts, which have failed again and again, because they struggled against the *vis inertiæ* of generations. Yet if experiments were made in the new lands, where the mezzeria has not yet been introduced (though it is gradually introducing itself into the Maremme); if the more improved systems of husbandry gave to the proprietors of land higher rents, and to the labourers higher gains, the influence of example and the calculations of self-interest might alter the existing state of things. The period, however, must be remote.—*Dr. Bowring's Report on the Statistics, &c. of Tuscany.*

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THE GOLD-MINES OF BRAZIL.

[Gold-Washing in Brazil.]

GREAT as the mineral wealth of Brazil is generally understood to be, there appears to us little doubt that the true extent of that wealth is entirely unknown, and that it may possibly far exceed the highest estimate that experience can enable us to form. Nor will the fact that there has been for a considerable period a continual decline in the amount produced of the most important of these minerals —gold—invalidate this statement, for the writers on the country are generally agreed as to the want of skill, energy, and capital exhibited by the owners of the mines, produced perhaps in a great measure by the no less certain absence of an enlightened system of regulations on the part of the government. That the Brazilian modes of obtaining this precious metal do exhibit such defects, and that, in spite of the decrease alluded to, there is every probability that the wealthiest stores may yet remain in the bowels of the earth, untouched, will appear, we think, sufficiently evident from the following account of the gold-mines of the country, and for the materials of which we are principally indebted to the splendid work of M. Rugendas.*

Gold is found in different parts of Brazil, but particularly on both sides of that extensive range of mountains known as the Serra dos Vertentes (the watershed range), from the Serra de Mantigueira to the north branch of the Serra dos Paricis, for a distance of about two hundred miles, but farther on the north than on the south side. It is also found in almost all the rivers which form the upper branches of the Francesco, Tocantins, Araguay, and Guaporé, but by far the greatest quantity has been found in the affluents of the Francesco. Of all those parts we have mentioned, the most productive gold coun-

* 'Voyage Pittoresque dans le Brésil, par Maurice Rugendas,' translated from the German.

tries are those included in the province of Minas Geraes, and more particularly in the neighbourhood of its capital, Villa-Rica, which is situated in the midst of mountains rich probably beyond all human calculation with the golden ore. The chain of mountains considered the most wealthy extends from Villa-Rica to Cidade Marianna and Morro San Antonio, in a direction from east to west, and comprising a space of two *legoas*. It has for its base a ferruginous mica full of sand, alternating with the iron-clay mineral that the natives call 'Jacutinga.' Of these lower beds there are about sixty or seventy feet; they rest upon the ordinary freestone of the country, or upon the slate-clay (*thonschiefer*) mixed with iron. The upper beds have a depth of from sixteen to eighteen feet in depth, and rest almost always upon a porous iron-ore. The lower beds contain the most gold, for in them are found the principal veins and layers of friable quartz, and those nests of the same rock called 'pots,' which produce the precious metal in the greatest abundance, and which are therefore the particular objects of search. As for the other ores we have mentioned, which are also rich in gold, the Brazilians neglect them entirely, not knowing how to work them. Gold-mining is in fact nearly in the same state as it was at the first discovery of the country by the Europeans. It is true that the existing laws were consolidated and digested only about the end of the last century, but they are still founded on the same principles, they still embody the same defects: only appropriate to the circumstances of the time for which they were made, they are now ineffective or mischievous. By those laws the discoverer of a district or a bed fertile in gold obtained one *data* or portion of sixty fathoms long and forty broad, which he was at liberty to mark out for himself. A second data was reserved for the government, which was however rarely explored for its benefit, being much more commonly divided among particular persons, or sold. A third data also appertained to the discoverer, if he possessed a certain number of slaves, and commenced to work it within a given time; otherwise this was also divided, with the remainder of the district, among various other persons according to the number of slaves they were willing to employ, and at the rate of two fathoms and a half square for each slave. We now proceed to describe the different methods in use among the Brazilians for the extraction of the gold from its native beds. These are threefold.

The first is to pierce the mountain in various parts till the veins of quartz and the nests we have mentioned are found, and then to dig down to the place, or until the rock becomes too hard for them to proceed without great efforts. They are often arrested by the poverty of the ore, or because the light with which they have already proceeded to a depth of some fathoms at length fails them. When either of these causes interrupts the work, the place is abandoned, and some other sought for at a distance, where it is calculated the same obstacles may not occur. It is accordingly rare to find a communication established between different excavations, while the great number of the excavations causes the mountain to have the appearance of being entirely broken up by the hand of man, wherever the native torrents have not already rent it asunder. The gold being thus obtained, the process of purifying is simple, and does not require any particular notice.

The second method consists of directing streams of water, by means of conduits made at a considerable expense, over the beds impregnated by gold, which, pouring down the mountain-slopes with great violence, and breaking up the beds, detach large portions of the soil, and carry them down with them into reservoirs at the base. The slaves also, furnished with levers and spades, assist in this operation by rending from the side of the hill the large masses which the waters may have loosened without detaching, and which thus set free are precipitated downwards amidst the foaming and roaring waters. In the reservoir the masses and heaps are all broken up, and whilst the water, sand, and gravel, owing to the slope of the reservoir, flow on through narrower channels, the larger stones are detained by a grate. In flowing through these channels or ditches, the water is stirred without ceasing in order to purify the gold, which gradually falls to the bottom, where it is received on the hides of oxen, or on thick woollen coverlids. These when sufficiently saturated are taken out and laid on the ground to dry; after that they are beaten till the whole of their valuable contents are extracted. The ancient beds of rivers are best adapted for this kind of work. There is here no use of machines, nor of mechanics; whatever the water itself fails to accomplish is left to the slaves, who perform their duties in the slowest and most awkward manner. It is tolerably evident that these washes must be wretchedly inefficient for the object in view. They are calculated to obtain simply the heavier particles of gold and those which are easily detached from the accompanying ore, but all the finer portions, all that which the ore does not readily yield is entirely lost, and submerged in the bed of the river. This method has not even the advantage of favourable pecuniary results, when the capital involved in the persons of the crowd of slaves engaged, and the continual expenditure necessary for their support during the entire year, and under all circumstances, are taken into the reckoning. The scene represented in the engraving at the head of this article, taken from the work of M. Rugendas, shows the entire process by this method.

The third method is that employed by the 'Faiscadores.' It entirely depends upon the defects of the other two modes. The stones before alluded to as being rejected as worthless, but which are still rich with the precious metal, are carried down into various rivers and streams, which, apart from that circumstance, bear a considerable quantity of gold in their waters. The Faiscadores have two methods of operation: for the first, they place themselves up to the waist in the water, and by means of a wooden bowl gather the sands of the river. By a peculiar mode of shaking and agitating the contents of the bowl, they cause the earth and stones to pass away, and the golden sand to sink to the bottom. They then empty the contents of this bowl into another, and continue their labours till the close of the day. In this manner a Faiscador may without difficulty obtain in the course of a few hours from one hundred and fifty to two hundred rées*; and, if he be very skilful, or has the advantage of recent heavy rains, his gains may amount to from four hundred to eight hundred. Other Faiscadores occupy themselves in heaping up the sand of the rivers and submitting it to various washings on the shore.

The methods adopted by the Faiscadores are open to every one; accordingly in the rivers of the gold districts nothing is more common than to see the negroes and the poorer classes of the people industriously pursuing this occupation.

The produce of all these methods ought to find its way into the imperial foundry; its previous circulation in the provinces being forbidden under the severest penalties. Here gold is completely purified by fusion, made up into ingots of different dimensions, assayed, marked, and one-fifth of the whole retained for the government. The bars of gold are then given to the proprietor, with a detail of the operations to which the metal has been subjected; it is only from that moment that the bars may be employed in the commerce of the country, or, the special permission of government being obtained, used for exportation. When it is wished to exchange ingots for coin, the government professedly makes the exchange, but as it is seldom in a state to be able to find the requisite money, and as

* The Portuguese milree (or piece of one thousand rées) is generally valued at about five shillings.

the exportation of the ingot is found highly beneficial, there actually remains little gold in the country except what remains buried in the mines; and Brazil, the richest country in the world in gold, presents the curious spectacle of a bad paper-money as almost its only representative of wealth. Before the commencement of the last century the quantity of gold obtained was inconsiderable, but it afterwards increased rapidly. The greatest amount was obtained between 1753 and 1763, and since that it has been constantly decreasing. According to the incomplete accounts which have been obtained by Eschwege, the entire quantity collected between 1700 and 1820 amounted to 63,417 arobas, or 4,058,688 marcs, or about 33,822 marcs annually, including one-fifth, which he thinks was smuggled out of the country. Between 1753 and 1763 the annual amount was 34,560 marcs; whilst between 1801 and 1820 it was only 8128 marcs. This decrease was principally owing to the better portion of the auriferous sand having been exhausted, and to the want of sufficient capital, energy, and enlightened governmental regulations to enable the veins in the mountains to be properly worked. The system has been essentially superficial. The population engaged in the gold working has decreased, as might be expected, in a similar proportion. In the middle of the last century eighty thousand workmen were engaged; there are now not more than sixteen thousand. Everywhere in the gold districts the traveller perceives the change, in the decadence of villages once flourishing, and in the multitude of abandoned habitations. For a long time the government believed or professed to believe that the decrease was simply owing to secret exportation. Severe laws were accordingly put in operation, troops and custom-house officers multiplied. Brazil, however, presents so many facilities to the smuggler, and the temptation of saving one-fifth is so great, that the government entirely failed in its object, and its vexatious measures served only to oppress and injure the legitimate commerce. There is little doubt but that a better organization of all the branches of this pursuit would bring it back to a more flourishing state, and develope most advantageously this great department of the national industry. The matter is so much the more important, that with or near the gold so many other valuable products might be obtained. Thus the mountains of Minas Geraes, so rich in that precious metal, contain also iron, lead, copper, platina, quicksilver, arsenic, antimony, bismuth, &c. They have also precious stones of almost every kind; topazes of the most various and beautiful colours, amethysts, garnets, crystals, &c., and above all diamonds, which are found at Tejuco and Abaité. British capital and enterprise have already made the attempt to produce a better state of things, and with success. Already they have obtained as their reward the productive mines at Gongo Soco, on the banks of the Rio des Velhas, a tributary of the Francesco. We must not omit to observe that various travellers have condemned the very general neglect of agriculture exhibited in the gold districts, even whilst it was evident that the occupation which occasioned that neglect was growing every day more and more unprofitable. In some parts, however, the inhabitants have exhibited more wisdom; and thus it is said on the whole that the very province of Minas Geraes is neither less rich nor populous than it was when the gold-mines were in their zenith. The cultivation of the soil is now making many rich whom the search after gold made poor; and it is worthy of observation that the planters of Barbacena, St. Lucie, and above all of Mattrodentro, enjoy generally great prosperity, whilst their neighbours in the districts solely devoted to gold-mining have necessarily been growing poorer every day with the decrease of the metal on which their prosperity depended.

GUY'S CLIFF.

Guy's Cliff, which is situated on the road from Warwick to Coventry, about a mile from the former town, and nearly the same distance by another route from Leamington Spa, is celebrated for the romance with which its name is associated, as well as for the exquisite beauty of the place itself. Guy's Cliff indeed forms part of a diadem of gems, itself being perhaps the chief ornament of the circle. In its vicinity we have the venerable and magnificent castle of Warwick; the romantic ruins of the castle of Kenilworth, rendered doubly immortal, if we may so express ourselves, by the magic pen of Walter Scott; "the inimitable spires of the ancient city of Coventry, with its interesting antiquities, and more interesting associations with some of the greatest events in the history of England;" and, though last, not least, Stratford, the birthplace of Shakspere, whose name would be tarnished by any eulogistic epithet, and whose genius would suffer by any attempts on our part to appreciate it: we can but "muse his praise."

Through the whole of the district alluded to above, "the silver-flowing Avon" pursues its devious course, and washes the very rock which serves for the foundation of the beautiful and romantic Guy's Cliff House.*

According to the celebrated Warwickshire antiquary, Rouse, who resided at Guy's Cliff as one of the chanting priests of its chapel, this place is of high antiquity in the history of England. Rouse says it was remarked and selected as favourable, from its solitude and beautiful scenery, to the sublime contemplation of religion, by St. Dubritius, a Christian bishop, who had his episcopal seat at Warwick, and who flourished four hundred years before the age of Guy, who is supposed to have died in 929.

So long ago as the reign of Henry VIII., Leland, speaking of Guy's Cliff, says it is "the abode of pleasure, a place delightful to the Muses. There are natural cavities in the rocks, small but shady groves, clear and crystal streams, flowery meadows, mossy caves, a gentle murmuring river (the Avon) running among the rocks; and to crown all, solitude and quiet, friendly in so high a degree to the Muses." Again, Camden, in his 'Britannia,' published about 1600, designates Guy's Cliff thus: *quæ ipsa sedes est amænitatis*—the seat itself of pleasantness. Sixty-two years after Camden, Fuller, in his 'Worthies,' describes it as "a most delicious place, having a steep rock full of caves, washed at the bottom by a crystal stream, besides many clear streams in the side thereof, all overspread with a shady grove, so that an ordinary fancy may here find to itself a Helicon and a Parnassus." Dugdale, the dry and dull antiquary, appears to have been half moved to something like poetry when contemplating the beauties of Guy's Cliff, for he exclaims, "It is a place that is of so great delight in respect of the river gliding below the rocks, the dry and wholesome situation, and the four groves of lofty elms overshadowing it, that to one who desires a retired life, either for devotion or study, the like is hardly to be found."

Of the history of Guy's Cliff, and of the famous individual whose name it bears, we shall now proceed to collect a few facts, or rather traditions, from the works of the ancient chroniclers who have written on this subject.

"Guye's Cliff," says one of these writers, "being a great cliff on the western bank of the Avon, was made choice of by that pious man St. Dubritius (as before mentioned, who, in the Britons' time had the episcopal seat at Warwick), for a place of devotion, where he built an oratory, dedicated to St. Mary Magdalene, unto which long after, in the Saxon ages, did a devout heremite repair; who, finding the natural rock so proper for his cell, and the pleasant grove wherewith it is backed,

* See a view of this House in vol. iii., p. 365.

yielding entertainment fit for solitude, seated himself here."

It seems that this place continued in the same condition a long time afterwards, for we find that in the 8th of Edward III., one Thomas de Lewis, being a heremite here, had the king's letters and protection for himself and all his goods.

Another writer observes that "Whether it was out of respect to the memory of the famous Guy, or to view the rareness of its situation, I cannot say; but certain it is that King Henry V., being on a time at Warwick, came to see it, and did determine to have founded a chantry here for two priests, had he not been by death prevented. After which Richard Beauchamp, Earl of Warwick, bearing a great devotion to the place, whereon then stood nothing but a small chapel and a cottage, in which the heremite dwelt, in the 1st of Henry VI. obtained licence to do the like for two priests, which should sing mass in the chapel there daily for the good estate of him the said earl and his wife, during their lives; and afterwards for the health of their souls and the souls of all their parents, friends, with all the faithful deceased. The same Earl Richard erected the statue of Guy, which still stands in the chapel." The statue here spoken of is carved out of a block of red-sandstone, but has been much injured by the wantonness of the workmen employed some years ago in enlarging the house. The height of the statue is nine feet, and a few years ago relics might be seen of the gilding and paint by which it had been ornamented.

We shall now proceed to make a few remarks relative to the personal history of the valorous and renowned Guy, and of the present state of the house and grounds of Guy's Cliff, where the greatest actor of her age, Mrs. Siddons, resided for some time.

The famous Guy, as the old writers inform us, married Felicia or Phillis, the daughter of Rohand, one of the first, if not the first earl of Warwick of the Saxon race. Rohand was a successful warrior in the days of Alfred the Great. By right of his wife, as the story informs us, Guy became Earl of Warwick. He is said to have been the son of Siward, baron of Wallingford, but the Welsh assert that he was of Cambrian extraction. In height he is represented to have been upwards of nine feet, and proportionately powerful. Amongst his feats it is said that he killed a Saracen giant in single combat, a wild boar, a dun cow of enormous size, and a fierce and fiery green dragon.

"The Saracen giant," says Mr. Field, after the old legend, "was Colbrand, chosen by the Danish invaders as their champion to decide the contests between them and the English, according to the proposal made to Athelstan, the Saxon monarch, and accepted by him." Guy, the stories tell us, when this challenge was accepted, had just returned from a pilgrimage to the Holy Land. We are further informed that he was pointed out to Athelstan in a dream by an angel, and recommended as the champion of England, he being at that time habited in the garb of a pilgrim. He was invited to accept the challenge, which he finally did. The combat is said to have taken place in a field near Winchester. Colbrand was so weightily harnessed that his horse could scarcely carry him; and before him went a cart loaded with Danish axes, great clubs with knobs of iron, squared bars of steel, lances, and iron hooks to pull his adversary towards him. The giant cut off the head of Guy's horse, when Colbrand stooping to regain his sword, which he had dropped, our hero with one mighty blow cut off the giant's hand; but, notwithstanding, Colbrand held out the combat till the evening of the day, when, faint with the loss of blood, he was obliged to yield.

"After this combat," says one of Guy's biographers, "the Earl bent his course towards Warwick, and coming thither not known of any, for three days together took almes at the hands of his own lady, as one of those thirteen poor people unto which she dayly gave relief herself, for the safety of him and her, and the health of both their soules. And having rendered thanks to her, he repaired to an heremite that resided among the shady woods hard by, desiring by conference with him to receive some spiritual comfort, where he abode with that holy man till his death, and upon his departure out of this world, which happened within a short time, succeeded him in that cell, and continued the same course of life for the space of two years after; but then discerning death to approach, he sent to his lady their wedding-ring by a trusty servant, wishing her to take care of his burial; adding also that when she came she would find him lying dead in the chapel, before the altar, and, moreover, within fifteen days after she herself should depart this life. Whereupon she came accordingly, and brought with her the bishop of the diocese, as also many of the clergy, and other people, and finding his body there, did honourably inter it in that hermitage, and was herself afterwards buried by him, leaving her paternal inheritance to Reynburn, her only son; which departure of famous Guy happened in his own age the sevcntieth."

Other acccounts state that he lived with the hermit of Guy's Cliff one year, and survived him two years; that during this time he went daily to beg his bread of his wife, the fair Felicia, or Phillis, who was perfectly unconscious of his existence.

That part of the 'Legend of Guy' relating to the preceding circumstance is as follows:—

"At length to Warwick I did come,
Like pilgrim poor, and was not known;
And then I lived a hermit's life,
A mile and more out of the town.

* * * * *

And daily came to beg my bread
Of Phillis, at my castle gate,
Not known unto my loving wife,
Who daily mourned for her mate.

Till at the last I felt sore sicke,
Yea, sicke so sore, that I must die;
I sent to her a ringe of golde,
By which she knew me presently.

Then she repayring to the cave,
Before that I gave up the ghost,
Herself closed up my dying eyes,
My Phillis fair, whom I loved most"

[To be continued.]

Use of Habits of Industry.—Let none who seek a restoration of their peace ever voluntarily indulge in idleness, or in that slight and trifling employment which forms only its excuse. On the contrary, let them draw out for themselves (if neither necessity nor duty impose it) a plan of constant occupation that must be followed steadily, regularly in its recurrence. It may be irksome at first—it may, in the commencement, be fruitless; but perseverance will have its perfect work at last; the attention will become arrested, thoughts will cease to wander, habits will become fixed, and the mind will at length find that it receives invigorated health as gradually but as surely as the continued but imperceptible breathings of a pure and invigorating atmosphere restore to the wasted body, after fever, that strength which has been prostrated by a destructive ardour during its burning course.—*Trials of the Heart.*

Effect of Moonlight on the Eyes in Eastern Countries.—The effect of the moonlight on the eyes in the eastern country is singularly injurious. The natives tell you, as I found afterwards they also did in Arabia, always to cover your eyes when you sleep in the open air. It is rather strange that passage in the Psalms, "the sun shall not strike (smite) thee by day, nor the moon by night," should not have been thus illustrated, as the allusion seems direct. The moon here really strikes and affects the sight when you sleep exposed to it, much more than the sun; a fact of which I had a very unpleasant proof one night, and took care to guard against it afterwards: indeed the sight of a person who should sleep with his face exposed at night, would soon be utterly impaired or destroyed.—*Carne's Letters from the East.*

THE ISLAND OF TERNATE.

[Island of Ternate.—From an original Sketch.]

[Late advices from Dutch India brought the news that this island had been entirely broken up by an earthquake. The place was to be utterly abandoned.]

Ternate, the most important island of the Moluccas, is in circumference under thirty miles. It consists of a cluster of hills, from the centre of which arises a lofty volcano, in shape somewhat resembling a pyramid. Around its summit there almost continually rests a heavy cloud, partly resulting from the smoke of the mountain itself, partly from the vapours which arise out of the valleys, and gather there before they dissolve in rain. At times this cloud is illuminated by light flashes which play around the edge of the crater, accompanied by volleys of red-hot stones, which have more than once reduced the neighbouring villages and plantations to ashes. It is at night, and during the stormy weather that prevails at the equinoxes, that this volcano most commonly puts forth its strength, and warns the inhabitants of the island, by its terrific voice, on what a precarious and unstable foundation they have raised their abodes.

It has been supposed, that "through all these chains of islands, even to Banda, are possibly chambered galleries, which convey the train from isle to isle, whencver the great Author of nature directs those awful admonitions." (Pennant, 'Outlines of the Globe,' vol. iv., p. 186.) In fact the whole archipelago of the Moluccas is replete with evidences of its having often been devastated by those physical revolutions called by naturalists *débâcles*. It abounds in strangely formed islands, abrupt peaks and eminences, and in volcanoes, as well extinguished as otherwise. Earthquakes are frequent, and render the navigation of the narrow seas excessively dangerous, as new sandbanks are by these means continually forming, to baffle the ingenuity of sailors, chart-makers, and geographers.

Every side of this mountain, previous to the terrific convulsion mentioned at the head of this article, was covered with thick forest, which, with the luxuriance of the underwood, the abruptness of the rocks, the frequency of great gaps and crevices, leading probably to the burning furnaces beneath, not to mention the wild boars, the serpents, and other noxious animals with which the place was infested, rendered the ascent to the crater an undertaking of no small difficulty and danger. Those who have reached the summit report that it was not covered with ashes, but with a sort of light cloddy earth, not unlike the pumice-stone burnt in our own fiery mountains. The winds at this elevation are extremely cold, and even in the valleys the heat is much more moderate than one would have been led to expect from their position on the globe. In a volcanic island this is somewhat remarkable, though the proximity of the sea on all sides may serve as an explanation.

From the rocks at the foot of the peak we have been describing, gush numerous springs of sweet water, some of which break over the crests of the hills and descend like torrents to the sea, whilst others pursue a more leisurely and unambitious course along the valleys to the same destination. The cause of this abundance of water is attributed by Argensola to the volcano itself, which attracts the moisture and causes it to sweat forth abundantly. On this subject, however, as on many others, there exists conflicting testimony in the writers who have treated of Ternate, some affirming that it contains no streams at all, but only one lake. We have adopted the opinion which seemed most probable, and which is supported by the greatest number of witnesses.

The soil of the island is, or rather perhaps was, fertile. In it European vegetables throve as well as at Batavia. It produced maize, but rice was not cultivated, the inhabitants preferring the more easily procured sago. The last-mentioned article of food is generally made use of in all the islands in this quarter of the globe, and it has been found by Europeans to be extremely nourishing, though the early travellers who tasted it universally agreed in condemning it as detestable. "It is," says one, "no better than ground sticks."

Spices, however, are the staple production. Among others of less importance are the Massoy bark, used for culinary purposes by the Malays, Javanese, Japanese, and Chinese; the *Laurus Culilaban*, which yields an

aromatic bark; and the *Melaleuca leucodendron*, or *Cajeput* tree, from whose leaf is obtained a fragrant essential oil.

But the clove and the nutmeg are the spices most famous and in most request. The tree which bears the former (*Eugenia Caryophyllata*) rises to the height of between forty and fifty feet, resembling a giant laurel. In May, when the rainy season commences, it displays a profusion of young leaves, and soon after the tender germs appear at the extremities of the shoots. Four months more elapse ere the fruit is fully formed, during which time it passes through all the gradations of green and yellow, until it at length assumes a blood-red hue. Then is the season of the clove-harvest; but three weeks more are required for the fruit to ripen sufficiently for propagation. By the expiration of this period it has assumed an extraordinary size, losing also much of its spicy quality, and containing a hard nucleus, like the seed of the bay. It now acquires the name of the 'Mother Clove.'

The tree that bears this spice is one of the most wonderful in creation. Although it cannot be successfully cultivated in large islands, yet the immediate neighbourhood of the sea is destructive to it, and whilst it invariably grows in mountainous countries, it refuses to thrive on the high hills. The gathering, drying, and packing of the fruit, however, are simple operations, and little care is required for its preservation as an article of commerce.

The *Myristica Moschata*, or nutmeg-tree, resembles in many respects that which produces the clove, except that it is more branchy and less pointed at top. The leaves, like all those of the nut tribe, are dark-green above and grey below. They in many respects resemble those of the pear-tree, but are somewhat larger. The fruit when on the bough is exceedingly like a nectarine, until perfectly ripe, when it assumes the aspect of the peach, and, bursting at the furrow, allows the reticulated coat of the nutmeg to be seen. This is what is called the mace, for the nutmeg itself lies within, enclosed in a thin brittle shell, of glossy black. The pulpy substance of the fruit has an astringent taste, and the eating of it is attended with dangerous consequences. Deprivation of reason, frenzy, and sometimes death are said to ensue.

It is a remarkable fact that the best trees of this species are produced from the seeds voided by the nutmeg-bird (a species of blue pigeon), whose excrement is supposed much to facilitate their growth. This, however, is not, as some have supposed, the only means by which they may be propagated, for the nuts produce trees, like any other seed, when planted by hand. Indeed the Dutch subject them to a process in order to destroy their power of propagation ere they will allow them to pass out of their hands. But the wide journeyings of the nutmeg-bird daily extend this spice over remote islands. "What pity is it, therefore," says a judicious writer, "for the Dutch to endeavour to confine it to the narrow bounds of the Molucca or Banda groups, when the very fowls of the air are able to baffle so unjust a monopoly."

The natives of the Moluccas themselves set little or no value upon the articles which have been so sought after by other nations. The Chinese first discovered these islands, and acquired a taste for the clove and the nutmeg, which they gradually diffused over the rest of the world. Indeed for some time the Moluccas formed a portion of the Celestial Empire, until the Javanese, and afterwards the Malays, took possession of them. The latter, however, soon yielded to the Persians and the Arabs, who planted the religion of Mohammed in the country.

About this time the king of Ternate attained such power by the prowess of his subjects, that not only the sovereigns of all the neighbouring islands, but even some of those of Celebes paid homage to him, and acknowledged themselves as his inferiors. But he was not satisfied with empty professions of respect, and exerted his influence to render his own country the centre of all the commerce of those seas. Accordingly, when the Spaniards and Portuguese made their appearance in the Indian Archipelago, they were compelled to proceed to Ternate before they could obtain cargoes of the valuable productions of the Spice Islands, the king having issued orders that all merchants should repair to his capital in order there to dispose of their goods.

By these and other means Ternate gradually attained great political importance, and in consequence became an object of envy and suspicion to its neighbours. Accordingly the kings of Celebes, Tidor, and other neighbouring islands, together raised the standard of revolt, collected a fleet, and proceeded to attack it. But they would probably have been unsuccessful, had not the Spaniards taken the opportunity of the embarrassment of the monarch of Ternate, and seized upon several small forts, not only on the islands of Amboyna, Banda, Timor, and Solor, but also on those of Tidor, Mackean, and even on Ternate itself. The Portuguese likewise, who, as Schouten expresses it, were not less able to fish in troubled waters than the Spaniards, made many seizures, and between the two nations, who had each sailed round half the world in order, as it were, to share in the spoils of the Moluccas, the Ternatian empire was completely shattered, and left a spoil to every invader, until the Portuguese, by building a large fort on the principal island, consolidated their power and completely subjugated the place. They did not effect this, however, without experiencing a desperate resistance from the inhabitants, who, almost immediately after arrival, burnt whole forests of cloves to the ground, in order to prevent the conquerors from experiencing any benefit from their acquisition. But the trees soon recovered, and grew with renewed vigour, much to the disappointment of their late masters, who thrice abandoned the island in despair, and thrice returned. The last time, they came at night, and again destroyed the plantations and all their own houses. In this manner sixty years passed away, with one honourable but brief interval; massacre, intrigue, and treachery being matters of daily occurrence, until the Dutch aspired, originally to a share, but very shortly to the whole of the Molucca islands. They were received as deliverers by the natives, and at first justified their confidence. But as the possession almost certainly entails the abuse of power, they soon made themselves odious to their allies (for in that light did they pretend to regard the unfortunate people whom they had subjected). The Ternatian people accordingly again took up arms, and began a desperate contest for their freedom. The aspect of a nation, however small their numbers, rousing themselves and making a stand for their liberties, has something imposing in it; the Dutch hesitated, and, after an indecisive war, entered into a league with the king of Ternate, as well as with the other potentates of the Moluccas, by which they alone were empowered to buy cloves. The severity, however, with which this treaty was carried into execution, caused fresh revolts, until, in 1680, the Dutch, by completely crushing the natives, found themselves in a condition to dictate their own terms to the unfortunate sovereign of Ternate.

Ever since that period the Dutch have persevered in extirpating all signs of the clove and nutmeg from every island and place where it is not under their immediate jurisdiction. They even offer rewards to whoever will destroy these trees; in consequence of which, a sergeant sometimes at an outpost, to get into favour, sends an account of his having discovered, on a certain spot, a parcel of spice-trees, with news at the same time that he has destroyed them every one. He is accordingly praised and rewarded, though at the same time the whole is probably a fabrication.

At one time the cultivation of the clove was confined to Amboyna, and that of the nutmeg to the Banda islands. It was not until 1778, when the plantations at

Banda were greatly damaged by an earthquake, that the Company allowed the nutmeg as well as the clove to be cultivated at Amboyna. The total destruction of Ternate may probably induce the directors at Batavia to extend its cultivation to some other island.

The demand, however, for both the clove and the nutmeg is much more limited now than it was in the middle ages. Black pepper and ginger, as well as the pimento have indeed in a great measure taken their place.

The native government of Ternate, before it was subverted or altered by Europeans, was a mixture of three forms. The monarch was the most important constituent part; but the nobles and the commons were respectively represented by magistrates possessed of considerable power. The Mussulman clergy also contrived to obtain seats in the senate, and contributed to render it noisy and tumultuous. The laws enacted by these were extremely barbarous, death being the punishment they inflicted for almost every crime, especially for that of theft.

When a rich man wished to marry, the agreement was made with little deference to the personal inclinations or attractions of the bride; at least the husband scarcely ever saw his destined wife until he brought her home. If, however, she failed to please him, he had the remedy in his own hands, and he took another wife, and another, until he was satisfied, or until his means forbade the further extension of his harem.

The women of superior rank go rarely abroad. They pride themselves on their long and black hair, which they anoint with sweet oils, and plait or curl according to their own taste. Their countenances are generally pleasing and expressive of much gentleness of disposition. The women, however, are by some considered to be less favoured by nature than the men, although for their latitude they are remarkably fair. The eyes of both sexes are large, and their eyebrows long, which, together with their eyelashes, they colour black. The complexion of the men has been by some compared to that of a quince, by others to that of a mole. They are strong in body, and are much addicted to war, taking little delight in aught else. They grow gray early, but are extremely long lived, and throughout life retain their activity both by sea and land. To strangers they are courteous, even to officiousness, but are said generally, upon longer acquaintance, to grow importunate and troublesome in their requests. They are accused of jealousy, fraudulency, and falsity in their dealings; of pride (which is not at all lessened by their poverty), and in fine, "to name many vices in one," of ingratitude.

Since the Dutch have had possession of the country, they have made many converts—among others, numerous women, who have become the wives of Europeans. The most prevalent religion of the natives is, however, that of Mohammed. The mosque is a fine building, and stands in the centre of the town. The priests have great influence at court, so much so indeed, that the king in his walks and journeys is invariably accompanied by several of them clothed in white garments. Besides these, on occasions of state, the princes and orancaies or noblemen attend him with a considerable array of soldiers, armed with halberds, muskets, lances, darts, and scimetars. He exacts the utmost respect from his inferiors, and only allows them to approach with many inclinations of the body, and an up-and-down motion of the hand during the whole of the conference. His dress of state is a sort of cloth, velvet, or satin, fashioned after the Dutch model. The grandees for the most part are content with a single piece of cloth wrapped round their middle. They sometimes wear a species of turban, made either of silk or a mixture of silk and the bark of trees, or, in fine, of simple cotton. They wear their hair down to their shoulders.

The women are lightly dressed, their bosom being only covered with a thin gauze. The lower orders have merely a kind of petticoat from their waist downwards. The latter are principally employed in sewing or spinning, or in preparing the pynang or betel-nut. Some sit at the corners of the streets selling fruit and other such articles, by which means they support both themselves and their husbands, who often throw the entire burden on the shoulders of the women.

The principal town in the island is called Maleie. It is situated along the sea-shore, and is partially walled. Orange fort, built by the Admiral Malclief, is its principal defence.

The ordinary habitations are built of a species of reed called *adass*, and roofed with palm-leaves. They stand separate from each other, but in regular rows, forming very fine streets, provided with covered walks and porticoes. The doors and windows are made to contribute as well to ornament as to convenience, and are placed with a good deal of skill. Each man, however, is his own carpenter, for wood is the only material they make use of. Furniture they require but little, a few mats standing them instead of chairs, tables, plates, dishes, beds, and covering. Their whole riches, in addition to these, consist in their cooking utensils, a hatchet for wood-cutting, their hunting and fishing tackle, and one or two other articles of absolute necessity. They reduce in fact the necessaries of life within very narrow limits. Locks, bars, and bolts, they have none; for it would be an act of supererogation in them to fasten their doors, when they have so little to tempt cupidity.

The palace of the king, situated in the town of Maleie, is a light and airy structure, and is surrounded by beautiful gardens, where are collected numerous choice plants and trees, laid out in parterres, or grouped around those elegant bowers with which the Orientals love to adorn their pleasure-grounds. Extensive aviaries also contain not only curious native specimens, but even great numbers of foreign beautiful and rare birds. Among the natives, remarkable for their uncommon loveliness, is the Martin Fisher, of a red colour mixed with sky-blue, and called by the natives "The Goddess." The numerous varieties of birds with which the island teems are exported, especially the three species of parrots called Lories, Perroquets, and Cockatoos. Birds of Paradise are often found dead in the woods, and are exported to many parts of the Indies, as well as to Holland, being highly prized in consequence of the peculiar brilliancy of their tints. Live birds of this species are obtained as tribute from New Guinea, over part of which the dominions of the sultan of Ternate extends.

HOME-SICKNESS, OR MAL-DU-PAYS.

Home-Sickness, or, as it is termed in medical nomenclature, Nostalgia (from two Greek words signifying return and suffering), is a severe and often fatal disease, afflicting persons condemned to long or hopeless separation from their native land. The affection manifests itself at first by a most profound and unmitigable dejection. The whole occupation of the mind is to dwell upon the recollections of the absent home. The individual most cautiously hides from others the source of his suffering, and, escaping as much as possible from society to solitude, broods over his misery alone. This intense suffering of the mind presently re-acts upon the body; the whole nervous system becomes shattered and open to every morbid impression; great emaciation rapidly ensues; and at no very distant period, if relief be not procured, fatal diseases are engendered, or those already existing are rendered mortal. Sometimes a feverish sleep only serves to aggravate the disorder by transporting the sufferer, during the troubled dreams which accompany it, to the scenes of his youthful and happy days: at other times a deep lethargy overpowers and oppresses every function and faculty.

It has been erroneously said that the inhabitants of mountainous countries are alone subject to this disease.

It should rather be stated that a life passed amidst scenes of native simplicity seems to predispose to it. Thus the Swiss, the Flemish peasants, the inhabitants of the Pyrenees, and the Bas-Bretons, have been found pre-eminently liable to it; while it has also frequently been observed among Scotch soldiers when serving in foreign countries. Even this statement is not exactly correct, for the affection has often been noticed in the French army among the conscripts taken from the towns; and Mr. Dunlop relates the case of a London pickpocket who was labouring under it at the hulks.

The circumstances under which the disease generally manifests itself are worthy of observation. Upon hearing the pastoral air of the 'Ranz des Vaches,' numbers of the Swiss in the French service, thus reminded of the beloved scenes they had left behind them, became afflicted with nostalgia, and frequently deserted. To such an extent did this take place, that the air, according to Zwingerus, was forbidden to be played on pain of death. The bagpipes produced the same effects sometimes in the Scotch regiments while serving abroad. M. Moriceau-Beauchamp, during his investigations upon this subject, observed, that the peasants who were brought from amidst their active agricultural pursuits into the army were very liable to nostalgia during the inactivity of their regiments; while the young men drawn from the cities, as long as they remained in the same climate, and could enjoy the pleasures of the camp, were exempted. But these latter, when called to the army of the North, and submitted to a laborious discipline they had never been accustomed to, often became nostalgic, while, under the same circumstances, the peasantry were found much less liable to the attacks. It has seldom been observed during the victorious march of an army, but as soon as reverses occur or the operations cease to be active, numerous cases break out. All navigators have observed the great disposition to nostalgia and other diseases among sailors during very protracted or unfortunate voyages; and thus Cook, Anson, Bougainville, and other commanders of expeditions, have always been very solicitous to provide occupation and amusement for their crews. Many sailors have fallen victims to this complaint, who, returning from a prolonged voyage full of joy in the anticipation of revisiting their home and friends, have been subjected to the severe law of impressment, and thus prevented realizing their fond hopes. The poor negro-slave, as naturally might be expected, sighing for his native land, from which he has been so cruelly torn, is a frequent victim of nostalgia, and while under its influence often commits suicide, in the superstitious belief that, by thus liberating himself from the toils of slavery, he will be enabled to revisit the home of his fathers. In other cases, as Dr. Winterbottom observes, the negroes resort to the practice of *dirt-eating*, which engenders many serious and fatal diseases.

The French Revolution was a prolific period for the production of the mal-du-pays; for not only did the emigrants frequently suffer from it, but many of those who were called from the peaceful occupations to which they had been accustomed, to undertake harassing military duty in distant regions, also fell victims to it. Indeed the disease has frequently raged epidemically among the conscripts of the French army, or has rendered prevailing diseases unusually mortal. This occurred to the army of Egypt after the battle of St. Jean d'Acre; while great ravages were committed from like causes during the expedition into Poland.

Nostalgia is seen much seldomer among women than among men, as they are much less exposed to the causes. The Parisian hospitals, however, present many cases occurring in female servants who have left their native provinces to seek employment in the capital. The young are more subject to the disease than those who are matured in years, but this is not always the case; and Baron Percy relates the case of a surgeon-in-chief, who, after an interval of repose of twenty years, entered upon active service in the campaign in Poland, but, being seized with most severe nostalgia, was obliged to return to France, the borders of which he had hardly reached when his health became re-established.

Medicines have little or no power over this disease, and, if much employed, do harm. It is almost solely upon moral treatment that the physician relies. But before employing this, he must detect the nature of the complaint, a matter not always of easy accomplishment, as the patient generally maintains an obstinate taciturnity in reference to the origin of his malady; and it is often only by means of considerable tact, or by overhearing some exclamation in his dreams, that a true idea of his case is acquired. Reasoning with him is of little avail, unless the person employing it is enabled to hold out to the afflicted person the prospect of returning home. If he can do this, the effect is quite wonderful; persons apparently almost dying rapidly recover their strength and spirits. No matter how remote the fulfilment of the promise may be, the hope infused by it soon effects the cure.

Sometimes, when a soldier has been permitted to return home, he has found that his imagination had exaggerated the blessings that awaited him at home, and he has returned contentedly to the army. Dr. Hamilton has published the case of a Welshman who was reduced at Ipswich to a most terrible state of depression by nostalgia, but who was speedily cured by the promise of a furlough. Baron Percy relates that, at the blockade of Mayence, numbers of the Bas-Bretons became subjects of the same disease, and that he cured them by informing them that permission had been obtained from the enemy for the sick, among whom they were to be included, to pass the lines. Zimmerman mentions the case of a young student at Göttingen, who, in despair at being absent from home, was a prey to hypochondriasm, and did not dare to stir for fear of rupturing a blood-vessel. When, however, it was announced to him that he could return home, every bad symptom vanished, and he traversed the whole town to bid his friends farewell. In short, unless the hope of return can be held out, no means will be successful in restoring health; while, when a promise of this kind is given, even though its fulfilment may be remote, it is quite remarkable to see from what apparently desperate circumstances recovery will take place. Kindness and attention will do much to prevent the occurrence of the disease. Baron Percy observes, the surgeon of the regiment should act as a parent towards the young conscripts or recruits, and he instances examples where the well-timed employment of acts of kindness has prevented the occurrence or spreading of the disease. It always manifests itself to the greatest extent in those regiments whose officers are harsh and severe, and among those servants whose employers are exacting or tyrannical.

As soldiers affected with nostalgia have frequently obtained liberty to return home, others have endeavoured, by feigning the disease, to procure a like permission. This however is not a very easy matter, and an experienced surgeon soon detects the pretender. In true nostalgia there is a profound dejection of countenance, a marked pallor of complexion, and an expression of intense sadness of the eye most difficult of imitation. The pretender again, afraid that his attendant should not comprehend his wishes, officiously obtrudes his absence from home as the cause of his sufferings; while the real sufferer most cautiously and even obstinately avoids all reference to this subject.

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HIGHLAND DEER-HUNTING.

[The Highland Deer-hound in Chase.]

IN what has been called, and, considering the qualities required, not inappropriately, the "Art of deer-stalking,"* the dog plays a comparatively subordinate part; the 'stalker' trusts rather to the unerring accuracy of his rifle than to the speed and prowess of his canine followers; but in the olden days of deer-hunting, before rifles were known, or any species of fire-arms dreamed of, it was very different; skill on the part of the hunter was undoubtedly needed then as now, but with his gallant dogs rested in a great measure the success of the chase. The stag had not then simply to be brought to any particular place, within range of the sportsman's shot; he had to be fairly followed and overtaken by superior swiftness, seized, and overpowered by superior force. It will be evident that dogs of no ordinary kind could accomplish this; we shall not, therefore, be surprised to find that the Highland deer-hounds were superior to every other known breed for the combination they exhibited of speed, endurance, courage, and power. But it is a matter of surprise, we may add, it is a matter to be lamented, that their noble race appears to be on the very eve of extinction. In the present paper we propose to give a few notices of its history, appearance, habits, &c., for which we must again express our acknowledgements to Mr. Scrope's recent work.†

This animal has been known by various appellations, as the Irish wolf-dog, the Irish greyhound, the Highland deer-hound, and the Scotch greyhound, for there appears no doubt that all the dogs thus denominated were essentially of the same breed. Its original home is supposed to have been Ireland, from whence, during the proud days of antient Rome, it was frequently conveyed in iron cages to assist in the sports of the city of the Tiber. In Buffon we find the following passage:—"The Irish greyhounds are of a very antient race, and still exist (though their number is small) in their original climate; they were called by the ancients, dogs of Epirus, and Albanian dogs. Pliny has narrated, in the most elegant and energetic terms, a combat between one of these dogs, first with a lion, then with an elephant; they are much larger than the mastiff." Of their size, power, and of their possessing the true greyhound form and appearance, the following quotations from Holinshed and Evelyn offer satisfactory testimonies. The former says, in his 'Description of Ireland and the Irish,' written in 1586, "They are not without wolves, and greyhounds to hunt them, bigger of bone and lim than a colt;" and the latter, speaking of a bear-garden, "The bulls [bull-dogs] did exceedingly well, but the Irish wolf-dog exceeded, which was a tall greyhound, a stately creature indeed, who beat a cruele mastiff."

Of the antiquity of the existence of a similar (and doubtless the same) race of dogs in Scotland, possessing a great general resemblance to the present greyhound, but much larger, stronger, and more courageous, there are many evidences. In the church-yard of Meigle, a village in Perthshire, are some sculptured stones, representing, in relief, the figures of several animals of this kind: the

* For an account of 'Deer-Stalking in the Highlands,' see vol. viii., p. 106, 119, of our publication.

† Description of the Highland Deer-hound, communicated to Mr. Scrope, by Archibald Macneil, Esq.

date of these sculptures is considered to have been prior to the introduction of Christianity. In various other parts of the country similar representations are found. In England also the breed appears to have been greatly encouraged. In the Anglo-Saxon times, a nobleman never went out unaccompanied by some of these dogs and his hawk, and so highly were they esteemed, that by the forest laws of Canute it was ordered that no person under the rank of a gentleman should keep one. Until after the Norman Conquest the chase was always, even in England, pursued on foot: the nobles of the Conqueror's train introduced the custom of hunting on horseback. As cultivation increased, and the most formidable objects of chase—the wolves—decreased in this country, the breed degenerated in size and strength, whilst the quality now more desiderated—speed—was, on the other hand, still more strongly developed; the result is the present race of greyhounds. But in Ireland, Scotland, and Wales the rugged character of the country kept up for a much longer time the ancient deer-hunts in all their essential features.

In describing the deer-hound we may first present our readers with the following translation from the Celtic, showing what the ancient ideas were of his personal requisites:—

> "An eye of sloe, with ear not low,
> With horse's breast, with depth of chest,
> With breadth of loin, and curve in groin,
> And nape set far behind the head;—
> Such were the dogs that Fingal bred."

Some of the finest living specimens are described by Mr. Macneil as varying in colour from pale yellow to sandy red, with considerable differences in the length and quality of the hair, and as having one common peculiarity — the never-failing accompaniment of purity of breed—namely, that the tips of the ears, eyes, and muzzle are black, whilst the rest of the body is of one uniform colour, whatever that colour may be. The principal difference between the original deer-hound and the common greyhound consists of the greater height of the shoulders, in the generally larger proportions of the head, neck, and muzzle, and in the quality of the bone, which is coarser. The gentleman we have just referred to estimates their former average height at thirty inches, their girth at thirty-four inches, and their weight at a hundred pounds. In disposition the deer-hound is more playful and attached than the greyhound, but bolder and fiercer if roused: he is also more sagacious. A striking peculiarity of this breed is that there is a greater difference in size between the male and female than in any other of the canine varieties. Of this noble race there now remain in England and Ireland no traces whatever, and in Scotland there are not probably in all above a dozen pure deer-hounds to be met with; as we have before observed, therefore, the race appears doomed to entire extinction, unless the possessors of the few remaining animals use extraordinary exertions to increase their number. That some such exertions may be made appears the more probable from the circumstance that the old Scottish mode of chase, deer-coursing, has not yet fallen into desuetude. Mr. Macneil's paper furnishes us with a very graphic account of the proceedings of a small party of six sportsmen, attended by a deer-stalker, &c., in the island of Jura, in August, 1835, from which we extract the following passage as illustrative of the qualities of the Highland deer-hound, even "in these degenerate days." We omit all the preliminary manœuvres to attain a favourable position, as they are essentially the same as those we have already described in the article on 'Deer-Stalking:'—

"The dogs were slipped, a general halloo burst from the whole party, and the stag wheeling round set off at full speed, with 'Buskar' and 'Bran' straining after him. The brown figure of the deer, with his noble antlers laid back, contrasted with the light colour of the dogs, stretching along the dark heath, presented one of the most exciting scenes that it is possible to imagine. The deer's first attempt was to gain some rising ground to the left of the spot where we stood, and rather behind us; but being closely pursued by the dogs, he soon found that his only safety was in speed; and (as a deer does not run well up hill, nor, like a roe, straight down hill) on the dogs approaching him he turned, and almost retraced his footsteps, taking, however, a steeper line of descent than the one by which he ascended. Here the chase became most interesting; the dogs pressed him hard, and the deer getting confused found himself suddenly on the brink of a small precipice of about fourteen feet in height, from the bottom of which there sloped a rugged mass of stones. He paused for a moment, as if afraid to take the leap, but the dogs were so close that he had no alternative. At this time the party were not above one hundred and fifty yards distant, and most anxiously waited the result, fearing, from the ruggedness of the ground below, that the deer would not survive the leap. They were, however, soon relieved from their anxiety; for though he took the leap, he did so more cunningly than gallantly, dropping himself in the most singular manner, so that his hind legs first reached the broken rocks below; nor were the dogs long in following him; Buskar sprang first, and, extraordinary to relate, did not lose his legs; Bran followed, and on reaching the ground, performed a complete somerset; he soon, however, recovered his legs, and the chase was continued in an oblique direction down the side of a most rugged and rocky brae, the deer, apparently more fresh and nimble than ever, jumping through the rocks like a goat, and the dogs well up, though occasionally receiving the most fearful falls. From the high position in which we were placed, the chase was visible for nearly half a mile. When some rising ground intercepted our view, we made with all speed for a higher point, and on reaching it, we could perceive that the dogs, having got upon smooth ground, had gained on the deer, who was still going at speed, and were close up with him. Bran was then leading, and in a few seconds was at his heels, and immediately seized his hock with such violence of grasp as seemed in a great measure to paralyze the limb, for the deer's speed was immediately checked. Buskar was not far behind, for soon afterwards passing Bran, he seized the deer by the neck. Notwithstanding the weight of the two dogs, which were hanging to him, having the assistance of the slope of the ground, he continued dragging them along at a most extraordinary rate (in defiance of their utmost exertions to restrain him), and succeeded more than once in kicking Bran off."* The poor animal is at length killed, but though told with great animation, we prefer omitting an account of the final struggle, in which the sufferings of the stag, we think, must have caused emotions more painful than could be compensated even by the excitation of the successful end of the chase, to a humane and well-constructed mind.

DOMESTIC CHEMISTRY.—No. XI.

STARCH.

STARCH may be extracted from different kinds of grain, such as wheat, barley, rye, oats, rice, maize, millet, &c.; it may likewise be obtained from peas, beans, and lentils, and from many tuberous and tap roots. The quantity of starch yielded by corn of different sorts is extremely variable; and even in the case of wheat, which affords the best as to quality, the return is uncertain, and is affected by circumstances of soil, manure, season, and climate. Wheat of inferior quality, or that has been damaged by long keeping in granaries, is often employed

* Scrope's 'Deer-Stalking,' p. 354.

in the manufacture of starch; but when this article is required to be of fine quality, the best corn must be used, and the process is as follows:—

The grain being well cleaned, it is crushed between iron rollers, and put into wooden vessels full of water, to ferment—a process which is assisted by exposing the vessels to the heat of the sun, and by changing the water frequently. The time occupied by this process varies according to the season, but seldom exceeds twelve or fourteen days. When the grain is sufficiently softened and fermented, it will burst easily under the finger, and will give out a milky white liquor. The grains are now removed from the water by means of a sieve, and put into a canvas sack, where the husks are separated by rubbing; and the sack is afterwards thrown into a tub of cold water, and trodden or beaten until the water becomes milky from the starch which is pressed out of the grain. Should any scum make its appearance on the surface of the water, it is carefully removed. The water is then allowed to run off through a fine sieve into a settling vessel, and fresh water is added to the grains, in order that any remaining farina may be extracted: this is repeated till the pressure of the grain no longer causes the water to become turbid. The farina or starch is now precipitated in the settling-vessels, and the saccharine matter also held in solution is got rid of by exposing the vessels to the sun, which produces the acetous fermentation, and purifies the starch by taking up such matter as would injure its colour and quality. This fermentation is no sooner completely produced, than the water is poured gently off from the starch; the latter is washed several times in fresh water, and then placed on linen cloths supported by hurdles, to drain. After the starch has parted with much of its moisture, the remainder is extracted by pressing and wringing the cloths which contain it, and then cutting the starch in pieces, and laying it in an airy place, where the floor, composed either of slightly burned bricks or of plaster, imbibes a share of the watery particles not yet dissipated; the heat of a stove is sometimes added, to complete the process, but this is seldom necessary except in the winter season. When the starch is thoroughly dried, it is scraped, in order to remove the outside coating (from which starch of an inferior description is made); and the pieces are then cut to a convenient size for sale. This is perhaps the simplest method of manufacturing starch, though there are others to which, were it necessary, we might likewise allude.

Potatoes contain a large quantity of starch, and an inferior quality of this article is frequently obtained from them. The potatoes are first washed in a cylindrical wooden cage, which revolves in a trough filled with water to the level of the axis. They are then reduced to pulp in a rasping-machine; which consists of a wooden drum covered with sheet-iron, and turned by a winch fixed upon each end of the shaft; the sheet-iron is roughened on the outside; and the whole is enclosed in a square wooden box. The potatoes are introduced into the machine at the top by means of a hopper, and a stream of water is made to play into it at the same time, that the rasp-drum may not become clogged and its rotation checked. Beneath the wheel is a pulp-chest, made to slide out, so as to be readily replaced, when full, by another. With this machine two men, with one for a relay, will rasp from two and a half to three tons of potatoes in twelve hours. The potato-pulp is now placed upon a fine wire or hair sieve, over the mouth of a large vat, and water passed through the sieve from several jets. While these streams are being conveyed through the pulp, the latter is well kneaded and stirred by the hand or a brush, so that nothing but fibrous particles are left behind. As this refuse of the first rasping generally retains about five per cent. of starch, which cannot be separated in this way, it is subjected to a second rasping upon another cylinder. The turbid water is allowed partially to settle, and is then run off into a second vessel, and afterwards into a third; so that the whole of the starch is at length precipitated, the last collected being the finest powder. The starch is now taken out and dried, and is fit for use.

Starch forms a considerable portion of most of the vegetable seeds used as food, and is contained in a great variety of plants; entering into combination with the sugar, oil, or other constituent parts of the vegetable. Thus, the substance extracted from the pith of the sago-palm, of which such frequent use is made in the diet of invalids, is nothing more than a species of starch. So is likewise the cassava, procured from the root of a plant growing in the West Indies and in Africa, and which, by a pecular method of drying, is made to agglomerate into small lumps called tapioca. The much esteemed powder obtained from the root of the West Indian plant *maranta arundinacea*, and known to us as arrow-root, is also a kind of starch, in the making of which a process is employed very similar to that which we have described above for the manufacture of potato-starch. The forms in which we receive sago, tapioca, and common starch are artificial; and were they all sold in a powder such as arrow-root, we should find that the difference in the character of the several substances could scarcely be detected without microscopical examination.

Starch is composed of minute particles, which, when examined by the aid of a microscope, are found to be granules more or less rounded, without any appearance of a crystalline form. It is supposed that these granules are moulded in the cellules of the texture by which they are formed; for it is probable that when first secreted and deposited in the cellules, they are in a semi-fluid state, and the excess of water is afterwards, by some natural process, removed. Some French chemists have shown that each of these minute grains is wrapped in a smooth integument not affected by water at common temperatures; within which integument is enclosed a substance rather more soluble.

In mixing starch for use, we may remark that the cold water which is first put to it does not dissolve the starch, but that the latter, falling into a powder, forms with the water a kind of emulsion; this combines with the boiling water, and forms a thick paste. The application of this paste to the purposes of stiffening is well known. In the process of boiling, it appears that starch undergoes a certain degree of decomposition, which brings it nearly to the state of gum: this may be observed by allowing boiled starch to cool to its usual form of a semitransparent jelly, and then drying it by artificial heat. There is indeed a kind of starch made solely for the purpose of being converted into gum for the use of the calico-printers, and the process having been first carried on upon a large scale in this country, the substance is now known by the name of British gum.

When starch in solution is added to a weak tincture of iodine, a fine blue colour is produced, which is very characteristic of starch, since the same effect is produced by no other substance. Iodine therefore furnishes us with a useful test for the presence of starch; and, on the other hand, starch is equally useful to detect the presence of free iodine. But if starch be gently roasted before a fire, its properties become changed; it assumes a pale brown colour, is soluble in water both cold and hot, and has in fact acquired the properties of gum, in which state iodine does not produce the blue colour with it. When bread is toasted, the surface becomes converted into a kind of gum; so that the familiar beverage 'toast and water' is in fact a weak solution of the gum obtained during the process of toasting the bread. Gum is also found ready formed in vegetables, and constitutes what is called *mucilage*: it frequently exudes from the stems and barks of trees, a portion of the water evaporates, and solid gum is left on the tree. Gum-arabic is a familiar

example of this natural product; it exudes from a species of acaeia growing in Morocco, whence large quantities are imported into this country. Our reason for noticing it here is because, like the gum obtained from starch, it is nutritious; and during the gum season it is said to constitute the chief article of food among the Arabs.

We owe to M. Kirchoff the discovery that starch is convertible into sugar. A spontaneous change of this description is supposed to give the peculiar sweetness we find in frost-bitten potatoes. It is said that a mixture of starch and water, if exposed to each other's action for a great length of time—two years for instance—will be found materially altered, one-half of the starch being actually converted into sugar. But there is a quicker and more decided method of producing this remarkable change. If a quantity of potato or wheaten starch be boiled for a few hours in water acidulated with sulphuric acid, adding water occasionally to make up for evaporation and to preserve perfect fluidity; and if it then be saturated with lime, and the boiling continued after separating the sulphate of lime, the solution will gradually become concentrated, and a dark syrupy liquid will be obtained, which on cooling affords abundance of sugar in crystals. This sugar differs in several respects from common sugar, being not quite so sweet nor so soluble in water. It also crystallizes differently, and is fusible at a much lower heat.*

In the process of germination, grains of wheat, barley, &c. lose much of the starch or farina which constitutes their substance, and become filled with saccharine matter; this is very sweet; it readily dissolves in water, and forms a syrup, which, by evaporation, acquires very nearly the flavour and sweetness of treacle. This is another way of observing the conversion of starch into sugar.

The consumption of starch in this country is not equal to that of some of the continental nations. In many parts of Germany, Switzerland, and Holland, the meanest peasantry are found to aim at that neatness of appearance which is given by the stiffened cap and frill, and in those countries the manufacture of starch is carried on upon a large scale. Our own consumption of starch is comparatively limited, especially since the discontinuance of the custom of wearing, or rather, using hair-powder, which has diminished the demand for this article. The greater part of the starch used in this country is manufactured in and near London, and almost exclusively of wheat-meal.

There is a way of employing the waste material from starch-works which is probably unknown to our younger readers. We mean the admixture of the starchy refuse with plaster of Paris, pipe-clay, or chalk, and making them, with a slight flavouring of sugar, into the various sugar-plums, lozenges, 'hundreds and thousands,' and other articles of hard confectionery, which are sold about the streets or by the inferior class of confectioners. There is a species of refined liquorice made in this way, which is nothing more than starch, lampblack, and a little common Spanish liquorice.

HEXHAM.

The town of Hexham in Northumberland is in the south division of Tindale ward, 278½ miles from London. The parish comprehends Hexham township, 4310 acres, with a population, in 1831, of 4666; and Hexhamshire, 24,060 acres, with a population, in 1831, of 1376: together, 28,370 acres, population 6042. Hexham is believed to have been a Roman station. Camden conjectured that it was Axelodunum, one of the stations of the 'Notitia,' on the line of the wall (*per lineam valli*), which later antiquaries fix near Carlisle; Horsley contended for its being the Epiacum (Ἐπίακον) of Ptolemy, a town of the Brigantes, which others fix at Lanchester.

Two inscriptions on stones in the vaults of the antient church are considered as proofs that a Roman station did exist here. In the seventh century (A.D. 674) a monastery was founded here by St. Wilfrid, who erected the monastic buildings in a style of magnificence little known at that day. He built also three churches in Hexhamshire, which domain had been granted to him by the queen of Northumbria. A few years afterwards (about A.D. 678), on the division of the Northumbrian diocese into three parts, a bishop's see was established at Hexham, and continued for many years, until the bishops were driven out by the Danes, and the diocese was afterwards united to Lindisfarne. The abbey and town of Hexham were sacked by the Danes early in the ninth century; and in A.D. 875 it was again attacked, the church burnt, and the inhabitants massacred.

In the twelfth century the archbishop of York established here a prior of regular canons of St. Austin, and bestowed on them the former cathedral, and many other gifts (A.D. 1112). In the Scotch wars of Edward I. the town and part of the church were burnt, and the title-deeds of the priory lost; but by royal authority an inquisition was taken (A.D. 1297), and their various gifts confirmed by charter. The revenue of the priory, at the dissolution, was 138*l.* 1*s.* 9*d.* gross, or 122*l.* 11*s.* 1*d.* clear.

The town is pleasantly situated on an eminence, near the south or right bank of the Tyne, a little below the junction of the North and South Tyne. It consists of several streets, the principal of which are tolerably wide, but the rest are generally narrow; the streets are partially paved and indifferently lighted. The market-place is a spacious square, tolerably well paved, and surrounded with pretty good houses; on the south side of the market-place is a market-house, furnished with piazzas; part of it is appropriated as a butter and poultry market, and part to stalls for butchers' meat: at one end of the building is a 'pant,' or reservoir, the water to which is conveyed by pipes. In the market-place is an antient stone building, with a dial in front, formerly used as the town-hall of the bishops and priors of Hexham, and now used as a sessions-house. There are a bridge over the Tyne of nine principal arches, and three supplementary arches to allow passage to the waters in time of floods; a suspension-bridge over the South Tyne, near the town; and a bridge with two arches over a burn west of the town. On the top of the hill on which the town stands, not very far from the town-hall, is a square tower, once used as a prison by the bishops of Hexham. But the most important building is the old priory church, used as a parish church. It is a cruciform building with a central tower, above 100 feet high to the battlements, or 125 feet high to the top of the vane. The nave, burnt by the Scots in the time of Edward I., has never been rebuilt; the transepts are separated from the choir by a screen richly carved in the lower part and adorned in the upper part by an emblematical painting. The choir is separated from its side aisles by massive clustered pillars supporting pointed arches; above these is the second tier of arches, of Norman character, separated by massive clustered columns; and above these again, a third tier of arches, pointed, supporting the wooden roof. There is a fine east window, and in the church are several antient monuments. There is an antient crypt, which some have supposed to be part of the original Saxon church built by Wilfrid. At the west end of the church are the remains of the monastic buildings; the refectory is yet entire, and is occasionally used as a room of entertainment; it is very spacious, and has an oak roof. There are some remains of the cloisters, which show the richness and excellence of their architecture. The gateway of the abbey, supposed by many to be Saxon, is also standing. There are two Catholic chapels, a Scotch church, and two or three other dissenting places of worship in the parish.

* See No. 552, page 433, 'Domestic Chemistry—Sugar.'

[Priory Church, Hexham. East end.]

Several manufactures and branches of trade are carried on,—spinning woollen yarn, hat-making, tanning, leather-dressing, and glove-making. The market is on Tuesday for corn and provisions; and there is a Saturday market for butchers' meat. A market for cattle is held on the alternate Tuesdays during a considerable part of the year. There are two yearly markets for horses, cattle, sheep, and swine: at the earlier of these, held in August, vast quantities of lambs are sold. The Midsummer sessions for the county are held here, and petty-sessions for the ward every month. In the western part of the town is a house of correction for the county.

The living is a perpetual curacy, of the clear yearly value of 139*l.*, in the peculiar jurisdiction of the archbishop of York.

There were, in 1833, a grammar-school, with a small endowment and sixty-five scholars; a school, partly supported by subscription, with two hundred and thirty children; seven other day-schools, with two hundred scholars; and six Sunday-schools, with about seven hundred and five children.

LAND-SURVEYING.

It will hardly be expected that the mere ploughman and carter, according to the present system of education among the agricultural population, should possess any knowledge of land-surveying, or of practical measuring generally, since to acquire a competent knowledge in land-measuring, timber-measuring, hay-rick measuring, &c., it is obvious that an intimate acquaintance with the names and properties of sundry geometrical figures is absolutely necessary; attainments which are hardly ever attempted by those who, from their early years, are engaged in the ordinary duties of farm labour. But fully to comprehend the science of land-surveying, so as to be able to measure fields and farms, and map them, and calculate their contents, upon strictly mathematical principles, and to be able to measure a regular-shaped piece of ground, and cast the contents thereof, are two very different things; for in the former case the measurer applies a mathematical knowledge by which he can easily prove the correctness of his work; whereas in the latter case a person may be taught to measure a piece of ground, and cast the contents too after a mere mechanical form, just as a child might be taught to do many things without in the least degree comprehending the principle upon which the operation is founded. It is our opinion, however, that where a farm-servant, or labourer, has been taught at school the first four fundamental rules of arithmetic, namely, addition, subtraction, multiplication, and division, and afterwards continued occasionally to practise them, so as to keep the method of performing the several operations familiarly in his mind,—there would be but little difficulty in instructing him how to measure and calculate the contents of almost any field or piece of ground which was not very irregular in its shape; and in many cases were a person of this humble condition able to undertake simple measurements of this nature, it would not only be the means of a saving in both time and expense to his employer, but often a source of satisfaction to himself in thus being able to determine many things connected with his ordinary work; and in ascertaining, when working by the job, that he is not imposed upon.

We feel somewhat apprehensive that there may be persons found who will be inclined to ridicule the idea of our introducing the subject of practical measuring, and that of land in particular, into a treatise professing to explain and illustrate the duties of the ordinary ploughman. But this shall not deter us from our purpose, for we consider the range which the ploughman fills to be so wide—beginning with the commonest order of farm labourers, and ending with the working farmer—that we feel assured, provided we succeed in making the remarks we purpose introducing upon this subject sufficiently plain, practical, and intelligible, that our labours will not have been in vain; for among the many, a few at least will be found both ready and willing to receive instruction. There is, it must be confessed, among the lower orders, and particularly among the rural population, a backwardness in attempting whatever appears not to belong

to their particular business or situation in life; and apparently a strong apprehension of not being able to surmount any difficulty, or to advance a step beyond the old and beaten track that those who preceded them had been in the habit of pursuing. This peculiar feeling cannot be too much discouraged and opposed; since, if rigidly acted upon, it can only tend to entail ignorance upon the already ignorant, from which nothing good or beneficial can possibly result; while, on the other hand, where men can be drawn or coaxed into a little laudable ambition, and so be induced to think for themselves and to exert the faculties they have had bestowed upon them, the chances are that in the end they will receive a manifold reward; at all events they cannot possibly be losers in the attempt to acquire a little useful knowledge, which may always be done without neglecting their ordinary business.

The rod, pole, or perch—for by all these names it is familiarly known in different parts of the country—is the measure the most generally adopted in measuring land, by such as are not professionally land-measurers. With the latter, however, the chain, which is four perches, or twenty-two yards long, is adopted instead of the shorter measure; and where a person understands measuring a piece of ground with a pole or a cord which is one perch in length, surely he would not experience much difficulty in substituting the chain. For convenience the chain is divided into smaller divisions called links, one hundred of which complete the whole chain; and as these one hundred links are equal to four rods or perchs, it follows that a fourth of that number, namely, twenty-five, are equal to one perch. The common land-measuring tables in our school-books run thus:—40 poles make 1 rood, 4 roods make 1 acre; but regarding the chain we will only observe, 10 chains in length, by 1 broad, is an acre; which is precisely the same thing as 40 poles in length, by 4 broad; for in either case the acre would contain 40 multiplied (×) by 4, equal (=) 160. The length of a pole, in feet, is 16½, or 5½ yards, and the number of feet contained in a perch of ground is 16½ multiplied by 16½, or 272¼. But since from persons who engage to measure crops of grass, grain, &c.—and for such we are now especially writing,—a great degree of accuracy is neither looked for nor required, any smaller quantity than a perch is seldom regarded in the calculation. When land is sold, sometimes at a very high price, a single perch may then be of a considerable value, and hence a regular surveyor is usually employed for the satisfaction of all parties concerned. The surveying chain, though exactly four poles in length, is not however divided into poles by any particular marks; but instead of which there is a piece of brass fastened to a small round ring at the end of every 10 links, each piece of brass having as many points to it as there are tens—reckoning from the nearer end to the place where it hangs; thus a piece with three points would indicate 30 links,—and so on: the centre-piece, or that placed at the end of 50 links, reckoning either way, is commonly of a round form, and without any points. The value of a good chain is about 12*s*. or 14*s*.,—but an inferior one, such as farmers commonly use, may be bought for 6*s*. or 8*s*.

Though the most general way for a farmer, or other person not practically a surveyor, to measure land, is with the assistance of a cord or a stick which is a rod in length—without any other implement or instrument whatever, by which means the contents are often attained with sufficient accuracy for common purposes; yet there is another, and even a ruder mode of measuring sometimes resorted to, by parties connected with farming and agricultural pursuits,—we mean that of measuring by the yard, or rather the pace, making use of no gauge or implement whatever. We are aware that there may, here and there, be persons found who are able, where the ground is tolerably smooth and level, to proportion their paces or strides with so great a degree of accuracy as to arrive very nearly at the truth; but when the surface is uneven and considerably sloping, the most practised pacer will be liable to fall into error. Besides, where the parties undertaking to measure parcels of land in this way are not tolerably expert at the use of figures; where the calculation has to be made in yards and not in perches or chains, there being more figures required, an unpractised hand is consequently the more likely to become puzzled and confused, and hence to commit errors in the calculation. Since 4840 square yards are contained in an acre, and 160 square perches are of the same extent, it follows that the number of yards divided by this number of perches would give 30¼ for the quotient; and hence it is that 30¼ square yards make one rod or perch; and a fourth part of 4840, or 1210, that is 40 times 30¼ yards make a rood. In endeavouring to explain this more clearly, we will suppose the contents of a piece of ground in the shape of a parallelogram, oblong, or, as the country people often call it, a *long* square, to be precisely one acre, the length being exactly ten times the breadth; that is, 220 yards, or 40 poles long,—and 22 yards, or 4 poles in breadth; or, in chains, it would be 10 long and 1 wide. Now, to calculate this in yards, after multiplying the length by the breadth, in order to obtain the whole content, it would be necessary to divide by the number of yards in an acre thus:—

```
 220 length          Then 4840)4840(1 acre.
  22 breadth              4840
 ---                      ----
  44
  44
 ---
4840 content.
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But were this measured in poles or perches, instead of yards, the work would stand thus:—

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 40 length          Then 160)160(1 acre, as before.
  4 breadth              160
 ---                     ---
160 content.
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Now had there been any surplus, or odd quantity remaining, considerable more work would have been required, particularly when calculating by yards; for what had remained over the acre must have been divided by 1210 in order to find the roods (if any); and then, if there had been a remainder still, that must have been divided by 30¼ in order to obtain the number of perches; or else, in order to avoid the necessity of dividing by a number that contains a fractional quantity—such as ¼, the remainder must have been multiplied by 40, and then divided by 1210, as in the case of ascertaining the number of roods.

[To be continued.]

GUY'S CLIFF.

[Concluded from No. 553.]

On a piece of rising ground between Warwick and Guy's Cliff, which ground is called Guy's Cross Hill, there was once a pillar, but it has not existed for some generations. To this pillar, according to tradition, Guy was in the habit of repairing, but for what purpose the aforesaid tradition does not inform us.

Corbett, first Bishop of Oxford, and afterwards of Norwich, thus humorously alludes to the circumstance in his 'Iter Boreale:'—

> "Beyond this, in the roadway as we went,
> A pillar stands where this Colossus leant;
> Where he would sigh, and love, and, for heart's ease,
> Ofttimes write verses (some say) such as these:—
> 'Here will I languish in this silky bower,
> Whilst my true love triumphs in yon high tower.'"

The legends relative to Guy differ in many particulars, and there can be no doubt that they are all, more or less, mixed up with fiction, though the existence of such a hero can be scarcely questioned. One of the rooms of

the eastle of Warwick was formerly covered with arras, on whieh the story of the battle between Guy and Colbrand was represented. This giant's battle-axe, or an axe bearing his name, was preserved for many generations in the Cathedral of Winchester. In the porter's lodge at Warwiek Castle are shown the so-ealled armour of Guy, eonsisting of his sword, shield, breastplate, helmet, walking-staff, and tilting-pole. The armour is enormously heavy, and undoubtedly very antient. The walking-staff and tilting-pole are of gigantic dimensions. In the same lodge there is also to be seen a large bell-metal pot, whieh, when a boy, the writer was gravely assured was Guy's porridge-pot. The contents of this vessel, eonsisting of many gallons, the hero was in the habit of devouring every morning for his breakfast. There are also exhibited here, Guy's flesh-fork, his lady's stirrup of iron, an enormous rib, said to be a rib of the dun eow, the pith of her horns, one joint of her spine, and a tusk and shoulder of the wild boar.

Having attempted to give a brief aeeount of the traditionary antiquities eonneeted with Guy's Cliff and the hero from whom it derives its name, we shall now proeeed to deseribe its present state.

It is impossible to give by any written description of Guy's Cliff (at least the writer feels it impossible) an adequate idea of its beauties. The front of the house is seen from the Coventry road through au avenue of gigantie firs, but this avenue is not the entrance to it, nor could any one, majestic as the trees are, form any notion of the plaee itself by viewing it from this point. The approach to Guy's Cliff is from the Coventry road, a little to the left of the avenue of firs just spoken of. It is earried along the edge of open and extensive grounds, by the side of shady plantations, terminated by a lofty and beautiful stone areh, which leads into the eourt, a most romantie and interesting plaee. The whole of this eourt is hewn out of the solid roek. There are subterraneous passages and eellars underneath, from one of whieh the influenee of the external atmosphere is so eompletely exeluded, that the temperature is found, in the hottest and coldest days of the year, to vary only a single degree. Opposite to these eellars are the stables and other offices, entirely formed in the roek. The summit of this rock is erowned with shrubs, eedars, and other ornamental trees, whose spreading and overhanging braneh̄es throw their dark shade over all beneath them, and give a singularly striking effeet to the plaee, which may perhaps be imagined, but cannot easily be deeribed.

On the left of this eourt, seated on the solid rock, which overhangs the Avon, though not here visible, stands the house, the side and earriage entranees to which are alone seen. It is substantially built of stone, presenting a solid and imposing appearanee. Some of the lower apartments of the mansion are formed out of the solid roek. They are however remarkably dry and healthy, and from the other side command a delightful view of the "silver-flowing Avon," the river of Shakspere, whose pellueid streams wash the rocks just beneath the windows, from which we have a view of large and beautiful meadows, green as the emerald, and interspersed with fine old trees, the whole being animated by grazing eattle and floeks of sheep. Beyond these meadows may be seen, perhaps a quarter of a mile from the house, an antique and picturesque water-mill, older than the Conquest, the voiee of whose waters, as they are seen splashing over the revolving water-wheels, gives a charm to the scene which no one, without beholding, ean properly appreeiate. In the foreground we have also a view of a rural bridge, and in the baek, of one or two interesting eottages.

Beyond the mansion, and in the eourt opposite the stables of the rock, which remind us of the city of Petra, stands the aneient chapel of which we have before spoken. Its embattled tower and Gothic windows, originally built in the reign of Henry VI., between four and five hundred years ago, are not without their effects upon the general appearance of this most romantie plaee. We ought to add that these stables have no external appearanee of being so appropriated.

But to be enabled to set a proper estimate upon the beauties of this part of Guy's Cliff, it must be seen at different times and under different eircumstanees. A hasty view of it by broad day-light, though very beautiful, will convey a very inadequate idea of the plaee. The writer has seen it by the pale moon-light of a fine summer night, when the tops of the trees and shrubs were "tipped with silver," and when the varied plumage of the peaeoeks, Guiana hens, pheasants, and other fowls that take their evening rest amidst their braneh̄es, are faintly, though at the same time ehastely and beautifully visible. He has seen it too in the spring, when the shrubs were putting on their mantles of green; and on a elear winter evening, when they were elothed with the hoar frost rendered mildly brilliant by the countless stars of heaven. Oh! eharming Guy's Cliff, dear haunt of memory of days that are past, thou art indeed most beautiful, whether beheld in the light of the rising sun or during his meridian splendour, whether in the gloaming of the evening or amid the thunder and lightning of the ungovernable tempest.

We have said thus much of what some would designate the mere baek part of this delightful spot. We shall now proeeed to draw our readers' attention to some of the other beautiful sceenes whieh it presents, and for this purpose we shall give them a walk through the pleasure grounds, at the commeneement of which the eye looks down, over a low wall, on the abrupt descent of the roeks, to the depth of forty feet below, and thenee wanders, need we say with delight, "over a rieh and varied landseape stretched before it, formed by a striking combination of wood and water and gently swelling grounds."

From several points of this walk may be seen Blacklow Hill, on whieh was beheaded Piers Gaveston, earl of Cornwall, whose fate and history are too well known to be repeated here. The late Mr. Bertie Greathead, proprietor of Guy's Cliff, eaused a very chaste and beautiful monument to be erected on this hill in eommemoration of the event alluded to, on which is engraved an appropriate inscription, the production of Mr. Greathead. (See vol. iii., p. 364.)

But to return to the walk. Passing under the shade of the avenue of aged and gigantic firs before alluded to, "a gentle descent," to use the language of Mr. Field, "conduets to *Guy's Well*, at which, according to popular story, that religious champion was aecustomed to slake his daily thirst. By order of Richard Beauehamp, earl of Warwiek, says Leland, "the silver wells in the meadows were enelosed with pure white sleek stones like marble, and a pretty house erected like a cage, one end only open, to keep comers from the rain." This was done in the reign of Henry VI., and it remains still as it was then left. The water, issuing from two eircular apertures, is beautifully clear. It is remarkable that the side of the well opposite the entranee is eovered with moss, which, below the surfaee of the water, is petrified; but in the obseurer parts there is "neither moss nor petrifaetion, a striking instanee of the effeets of *light* upon the growth of vegetables."

Leaving *Guy's Well*, we are eonduеted to that part of the rock on the perpendicular edge of whieh the house stands, forming a very striking and interesting objeet, which has frequently formed subjeets, from different points of view, for the easel of the painter. The overhanging ivy, whieh clothes the sides of the rock, produees a very rich and beautiful effeet. In the roek itself there are several chambers; but it is diffieult to say, from their appearance at this time, whether they were originally

formed by art or nature. As we procced we havc a view of the chapel, under which therc are several apartments, anciently the habitations of the chantry priests. These apartmcnts remain unaltcred and entire.

The next object of curiosity which presents itself is Guy's Cave,

> " Where with his hands he hewed a house
> Out of a craggy rock of stone;
> And lived like a palmer poor,
> Within that house alone."

So runs the lcgend; but we agree with Mr. Field, that its upper part has all the appearance of a natural cavity. The lowcr portion, however, is evidently hewn out of thc rock, and resembles a grave. According to some traditions, in this grave the renowned Guy was interred. On the side of the cavern a few single Saxon lctters are visible, or were a few years ago. These are supposed to be thc remnants of an inscription. A walk still called by the name of fair Phillis passes over the cavern. To this walk, says the legend, she was in the habit of going, while her husband, unknown to her as such, was engaged in his devotions below.

For the remainder of the description of this walk we shall, in substance, follow Mr. Field, who, just a quarter of a ccntury ago, published a very interesting descriptivc and historical account of the town of Warwick and its environs.

Pursuing the course of the walk, the rocks assume a more romantic and bolder appearance, and from thcir towering height, the vast variety in their form and colour, and the great divcrsity of trees, shrubs, and crceping plants, which everywhere fix their roots, and spread and throw their branches, the scene becomes beautifully picturesque, approaching to grandeur. On the opposite side, in pleasing contrast, appear the winding course of the "gently flowing Avon" and the soft fertility of thc meadows. A winding path carried through a shady plantation leads to thc summit of the cliff, the perpendicular cdge of which rises nearly sixty feet, and commands a view of the surrounding landscape seen from a new point. As we pass towards the terrace wc have an imposing view of the town of Warwick, with its beautiful tower of St. Mary's church, the spirc of St. Nicholas, and the lofty battlements of the venerable and majestic castlc. We have now reached the close of this enchanting walk, of which it was well said by Fuller, the celebrated author of the 'Worthies of England,' that "it is a most delicious place, so that a man travelling many miles cannot mcet with such astonishing variety as this onc furlong doth afford."

A short distance from the above walk, but hid from vicw by the plantations, there is a wild and sccluded spot not usually shown to strangers. It is not, however, without its attractions to those who feel any interest in the rise and progress of Guy's Cliff Housc. This place is principally occupied by a stone-quarry, which, in the time of Mr. Bertie Greathead, thc late proprietor, was worked for the purpose of procuring stone for the erection of some additional buildings to his mansion. In the middle of this quarry there stands a grotesque statue of something likc a man, formed out of a portion of the rock evidently left, and probably for that purpose, by the quarry-men whcn engagcd in removing the surrounding stone. This statue, if we may so call it, bears an inscription writtcn by the late Mr. Bertie Grcathead, in imitation of the South Warwickshire dialect, of which it is the only written spccimen we ever saw. As it is believcd that it has never been published, we subjoin a copy:—

> " Here be I, Dick Ward, y-eon aout i' the rock,
> To which I ha' geen full monny a nock,
> And a thisn shall stond 'ill wayager a paound,
> When ye loggeryeds all lie six feet i' the graound.
> Thof my bak's summut humpy,
> And my legs ower stumpy,
> Ye may loffe a ye wool,
> But never a sole
> Among you grinners
> Coold meach sich a hole:
> Will Russel cut ears, eyes, and nosy;
> The Squier his sel faound aout the poesy."

Mr. Bertie Greathead, though a man of fortunc as well as a man of letters (he was thc author of a tragedy called the 'Regent'), was familiar and kind to the workmcn whom he employed and to all the labourers in his neighbourhood. He was emphatically a gentleman of thc old English school, who, though he did not feast *all* the rich, he forgot no portion of the poor. He was descended on the matcrnal sidc from the dukes of Ancaster.

Of the intcrior of Guy's Cliff Housc we shall merely observe that it contains many large, commodious, and well furnished rooms, with a collection of paintings and sculptures, all of which are respectable, and some of extraordinary merit, both by ancient and modern masters.

Thistles on the Pampas.—After emerging from the quinta and chaeara grounds, some six leagues from the capital, we eame upon the cardales, or 'thistleries,' which, at the time I speak of, reached to Arroyo del Medio, the boundary of the province of Buenos Ayres. Since then they have gone on extending their dominions on all sides, and they seem destined to become at last the great vegetable usurpers of the whole Pampas. When I left Scotland, I thought I had left the country, par excellence, of thistles behind me; I now found that those of my native land, as compared with the 'thistleries' of the Pampas, were as a few scattered Lilliputians to the serried ranks of the Brobdignagians. From one post-house to another a lane was cut out through these huge thistle-fields, which hemmed you in on either side as completely as if you were riding between walls fifty feet high; you saw as little in the one case as you would in the other. The cattle find *shade* in these cardales, and are often lost among them for days: they afford a good shelter for highwaymen, and when at their highest growth, they are a favourite resort for gentlemen of the road. They tower above your head, and in many cases hide the post-house from your view till you come close upon the door. In short, Pampas thistles, like all things else in South America, are on a large seale.—*Robertson's Letters on Paraguay.*

Why the Nettle stings.—The common or large nettle is known by grievous experience to every one, though perhaps you have never yet inquired whence the pain arises from touching it. The sting is not, like a pin or needle, solid throughout, but is hollow at the eentre and perforated at the point; and, when touched, it is not only sharp enough to pierce the skin, but also is so constructed as to inject a particle of poisonous fluid into the wound it makes, and this is the source of the pain which follows. The wound itself is so minute that it would scarcely be felt; but the poison irritates, inflames, and causes the well-known pain alluded to. The plant, the small species of which stings the most severely, is covered all over with hairs; but, by using a microscope or a magnifying-glass, you may perceive that these are not all of one kind, some being perforated, which are the stings, whilst others are not. Each sting stands upon a pedestal, and the pedestal performs the office both of gland and poison-bag. It is cellular and spongy within; the sting is placed on its top, and may be moved by a slight pressure to either side, or round in a circle: it seems to stand, as it were, on a universal joint. When a body touches its point, the base is pressed down into the spongy pedestal, and the poisonous fluid rushes up through the tube of the sting, and flows out of the terminal aperture.—*Drummond's Letters.*

Roads in Shetland.—Walking is, of course, a most necessary accomplishment in this country, where the shoes are made of materials so very substantial, that an old gentleman used to say, "he wore in the morning three rows of nails on the sole, but for full dress only two rows."—*Miss Sinclair.*

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THE MANDIOCA-ROOT OF BRAZIL.

[Preparing of the Mandioca-root.—From a Sketch in 'Voyage Pittoresque dans le Brésil, par M. Rugendas.']

THE Mandioca or Cassava root is a plant of the genus Jatropha, and belonging to the natural order Euphorbiaceæ, which is grown extensively in almost every province of Brazil; and though as a plant almost entirely unknown among us, forms the chief article of food to all the poorer classes of that country. There are above twenty species; all, with but one exception, abound in a highly poisonous juice, very small doses of which will produce serious and sometimes fatal consequences. The exception we have mentioned is the species called Macaxeira, and which is perhaps the least used of any of the cultivated kinds, on account of the small size of the root: it is grown as a luxury merely. There is another species which is entirely prohibited on account of its peculiarly active poisonous qualities: this is known by the name of Manipeba. The wild or spurious kind, called Aipim, when roasted, is considered as not inferior to roasted chestnuts.

Mandioca is one of the plants originally cultivated by the aborigines or Indians of Brazil, and not only do they continue still to cultivate it, but their mode remains unaltered, and is essentially the same as that now pursued by the Brazilians generally. The same, with but slight modifications, may be said of the preparation of the root. For the growth of this plant a dry hot soil of a sandy nature appears to be considered the most suitable, which is raked up in small round hillocks (giving one the idea of mole-hills), about four feet apart. Into these hillocks cuttings of the branches of the plant, about an inch thick and seven or eight inches long, are stuck. The cuttings soon take root and put forth their leaves and buds; and in about eighteen or twenty months form plantations of trees, four or five feet high, with large branching stems, and presenting altogether very much the appearance of a grove of castor-oil trees. The foliage is now all cut away and the roots dug up, which resemble irregularly-shaped parsnips: each plant produces in good ground from six to twelve pounds of these roots. The soil must now be allowed to rest for one or two years, as it will not support annual crops. No sooner are the roots dug up but they are prepared for food, either for the cattle—which is done by simply slicing them and leaving the pieces exposed to the sun for a few hours, which draws off in exhalations all the poisonous qualities,—or for man, which requires a more lengthened and elaborate process. It is a curious property of this root that it cannot be preserved in a crude state even three days: it must therefore be immediately eaten by the cattle, or prepared in the manner shown in the engraving. The work-people, it will be seen, are all negro slaves, with the exception of the overseer, ready, whip in hand, to enforce attention and industry. The roots are first handed to the group in front of the picture, whose duty it is with a blunt knife to remove the peel. The next operation is to wash the roots very carefully, which is confided to the two females on the left. The roots are now ready for the man at the press in the corner, who with one hand turns the wheel, while with the other he presses the root against the millstones, between which it is drawn and reduced to pulp. After the juice has been extracted, as far as possible,

from this pulp by pressure, the latter is placed in the vessel from whence we see the steam rising so densely, and there kept continually in agitation by stirring, over a brisk and regular fire, until it becomes dry; it then assumes a granular appearance, is allowed gradually to cool, and lastly is packed in barrels, when, if kept from moisture, it will remain good for a long time. The product thus obtained is called by the Brazilians, Farinha de Poa, or stick-flour, the first part of the English appellation arising from the bits of hardened fibre found in the flour. The Mandioca-flour thus prepared is used as food in different ways. Among the higher ranks it is made into bread, for which it requires little preparation; whilst the poorer classes, the slaves, &c., frequently eat it as it is, dry, without any preparation, or mix it with boiling water or gravy, in which state it is called Piram. The meal swells very much when moistened; hence it is supposed, that if that effect take place in the stomach, injury ensues. At all events the planters generally consider it unwholesome to eat the Mandioca-meal dry, and therefore make it their business to see that the slaves do not from fatigue or indolence neglect to mix it in the manner we have mentioned. Half a pound of this substance is said to be sufficient for the daily sustenance of a man. In broths and soups it becomes gelatinous, and affords rich nourishment. Another mode of preparation of the root is to soften it by steeping it in water in covered baskets for some days; it is then called Mandioca molle, and is made into cakes, &c.

With regard to the poisonous qualities of the Mandioca, it is said by some of the older writers that the root is so deletcrious as to bring on a torpidity, of which the patient dies unless kept moving or dancing, so that the plant was a vegetable tarantula. The Indians used the juice to poison their arrows. It is said that even now pigeons are caught by steeping grain in thc juice, which they no sooner swallow than they lose all power to fly away. The poison must be of a very volatile kind, for it may be exhaled even from the juice by heat, and one of the nutritious articles of dict commonly used by invalids among us—tapioca, is a kind of starch deposited from this very juice. Arrow-root is also a product of the Mandioca. The original cultivators of the Mandioca, the Indians, not only managed to obtain an excellent food from it, but also a spirituous intoxicating liquor. Their very primitive mode of preparation is thus described by Southey:—

"They prepared it by a curious process, which savage man has oftcn been ingenious enough to invent, and never cleanly enough to reject. The roots were sliced, boiled till they became soft, and set aside to cool. The young women then chewed them, after which they were returned into the vessel, which was filled with water, and once more boiled, being stirred the whole time. When this had been continued sufficiently long, the unstrained contents were poured into earthen jars of great size, which were buried up to the middle in the floor of the house; these were closely stopped, and in the course of two days fermentation took place. They had an odd superstition that if it was made by men it would be good for nothing. When the drinking day came, the women kindled fires round these jars, and served out the warm potion in half-gourds, which the men came dancing and singing to receive, and always emptied at one draught. At such times they smoked an herb which they called Petun, some in pipes of clay, some in the shell of a fruit hollowed for the purpose; or three or four dry leaves were rolled up within a larger one, as tobacco is commonly smoked in Spain: it was a hideous sight to behold them, as the smoke issued through all the holes in their cheeks, or was forced through the nostrils. While they drank, the young unmarried men danced round with rattles on their legs. They never ate at these drinking parties, nor ever desisted from drinking while one drop of liquor remained, but having exhausted all in one house, removed to the next, and so on till they had drunk out all in the town; and these meetings were commonly held once a month. In taste the liquor is said to resemble milk."*

LAND-SURVEYING.

[Continued from No. 554.]

The non-professional measurer, whether of land, boards, or sheet-iron, or any other flat surface, is generally believed to consider a square as the most simple geometrical figure to be met with; while to the experienced measurer all figures are considered equally so, though to calculate the contents of some of them will require considerably more time and a far greater number of figures than others will do. All figures that are regular, and true or complete squares, whether they be composed of wood, metal, glass, land, or anything else, have the length and breadth precisely the same,—it being quite immaterial which dimension shall be considered the length and which the breadth; so that could we be certain that a piece of ground (or anything else to be measured) were a perfect square, it would only be necessary to measure one side or dimension of it, since the measurement of any one side multiplied by itself or the same measurement, would give the true content of the figure. Suppose, for example, the side of a small square field or piece of ground to be exactly 20 poles or rods, the quantity of ground contained therein would be found as follows:—

20 poles
20

An acre = 160)400(2½
320

80
80

Here 20 multiplied by 20 gives 400; and 400 divided by the number of poles in an acre, that is 160, the quotient is 2 acres, but there is a remainder of 80 poles, and 80 being just the half of 160 (or twice 40), it follows that this remainder is just half an acre; so that the whole 400 poles are precisely 2½ acres. In order to make the nature of the square still more easily comprehended, we will suppose a square plate of glass to be exactly a yard each way, or three feet, which is the same as one yard. Now, in order to ascertain how many square feet of glass are contained in this square plate, we must, as in the previous instance, multiply the side by itself, that is 3 by 3, thus:—

3 feet
3

9 feet.

And we prove, by drawing the annexed figure, that this is correct; and it will also assist in convincing the unlearned measurer, that if the truth of this is applicable to a small square, one where each dimension is but three feet, it will equally apply to any larger square, no matter how large or extensive it may be; for by constructing the figure after the fashion of the annexed one, and dividing it either way, according to the number of feet, yards, or poles, contained in one dimension,—on calculation it would be found to contain the same number of parts as the side multiplied by itself.

1	2	3
4	5	6
7	8	9

Next to the square, probably the most simple figure is that known under the various names of the parallelogram, oblong, or long square; a figure that, although its length is greater than its breadth (hence the name of long square), thc length and breadth being equal in every part of the figure, in finding the contents of it it is only necessary to measure one side and one end; and these two dimensions multiplied together produce the content of the whole,

* Southey's 'History of Brazil,' vol. i., p. 233.

whether the calculation be made in inches, feet, yards, poles, or chains. Indeed it is as common and nearly as simple a figure as the square, but it has two dimensions instead of one. Any common board, the breadth of which is everywhere equal, is an oblong, or figure of this sort; and the window near which we are writing is another specimen, but the breadth in this case is much greater in proportion to the length than is the case with boards in general. Suppose a plank, a pretty wide one, to be two feet in breadth, and the length twelve feet and a half, the contents will be $12\frac{1}{2} \times 2 = 25$ feet, or thus :—

$12\frac{1}{2}$
2
—
24
1=two halves.
—
25 total content.

To prove that this is correct, here is the figure, for there

½	1	2	3	4	5	6	7	8	9	10	11	12
½	13	14	15	16	17	18	19	20	21	22	23	24

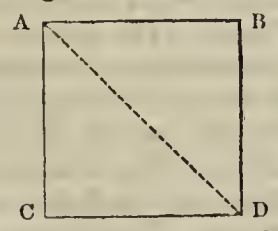
are 24 whole divisions or parts, and two half-divisions, which are equal to a whole one, altogether amounting to 25.

In reference to the window which we spoke of, the height—which is the longer dimension, and may therefore be called the length—is 5 feet, and the width, which is the breadth, is $3\frac{1}{2}$ feet; the quantity of glass it therefore contains, without making any allowance for the framework in which the panes are set, would be $5 \times 3\frac{1}{2} = 17\frac{1}{2}$ feet; the operation would stand thus :—

5 feet.
$3\frac{1}{2}$
——
15
$2\frac{1}{2}$ (or the half of 5)
——
$17\frac{1}{2}$ total content.

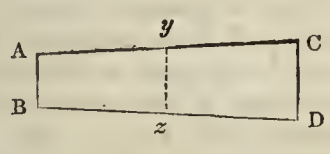
It seems unnecessary to introduce another figure in order to represent the window; it would require to be constructed of 5 small squares in length, and $3\frac{1}{2}$ squares in breadth.

We are well aware that many persons of inferior education, the moment they meet with any geometrical or mathematical figure (and all figures or diagrams connected with and elucidating measurements in general are of this sort), take the alarm, and never attempt to bestow the least attention upon it, apparently taking it for granted that it would be useless their doing so, inasmuch as it would be impossible for them to comprehend the meaning of the writer. But this would be carrying a diffidence and distrust of their own capabilities to a foolish extreme, for in many cases the nature, if not the properties, of simple figures may be so clearly explained, that persons who are capable of reading the explanation, and at the same time eager to comprehend it, will seldom be disappointed or foiled in their attempts. For who is there that is so stupid as not to comprehend that the dotted line drawn through the annexed square figure, that stretches from corner to corner, or from A to C, must divide the figure ABCD into two equal parts, for if the figure were a piece of paper, or a piece of board, when divided along the said dotted line, and one part turned back upon the other part, they would be found exactly of the same size, and all the outlines or edges of the one exactly corresponding with the outlines or edges of the other.



Hereafter we shall find occasion to speak of trigons, or triangles (three-sided figures), and it may here be observed that the dotted line AD divides the annexed square into two equal triangles; and further, that not only regular squares, but oblongs or long squares are divided into two equal parts or triangles by simply drawing lines across them from the opposite corners or angles, as in the square already alluded to. All the figures are drawn to a scale of 20 rods to the inch.

One of the shapes or figures most commonly met with in measuring land is of the oblong or long square description, but it frequently happens that such figures are not quite regular in their form, that is, one side may be a little longer than the other, or one end may be broader than the other, in which case, multiplying the length of one of the sides by the breadth of one of the ends could not possibly give the true content. Now in the annexed figure, A, *y*, C, B, *z*, D, one end (AB) is wider than the other end (CD), but the sides are of an equal length. Let the length be 20 rods, and the breadth of the greater end 6 rods, and of the less end 4 rods. Then to find the true content it will not do to multiply the length (20) by either 4 or 6, as one would give too little and the other too much; but we must multiply the length by the breadth that the figure is in the middle, that is, at a point equally distant from either end; and in order to ascertain that breadth we have only to add the two ends together and divide by 2; thus, 6 added to 4 makes 10, and 10 divided by 2 gives 5, which would be found to be the exact distance across from *y* to *z*, were that distance accurately measured. But if the sides AC and BD slope much, this plan will not be found sufficiently accurate, for an oblique or sloping line is always longer than the centre of the body of the figure; but in ordinary practice, such as we anticipate ploughmen and farmers engaged in, the plan here adopted will generally be found sufficiently near the truth. Then the calculation of the contents would stand thus :—



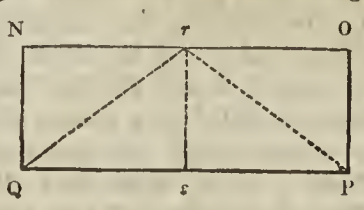
20
5, or the half of 10
——
4,0)10,0
——
2 roods 20 poles,

that is, $20 \times 5 = 100$; and 100 divided by 40 (40 rods making a rood) gives 2 roods and 20 poles, or half an acre, and 20 poles or half a rood over, 20 poles being the eighth part of an acre. In the like manner a carpenter would calculate the content of a board which measured more inches across one end than across the other; for, having first ascertained its length by applying his foot-rule or some other scale to it, he then would measure the breadth at either end, add these two breadths together, and divide by 2 to find a mean or medium breadth, and afterwards multiply the length and mean breadth together in order to find the true content.

In order to carry out the view we had in endeavouring to convince the uninitiated, that there is little difficulty or perplexity to be apprehended in measuring plain and regular-shaped figures, we do not think that we ought to stop at the point which we have already reached; but in making a still further advance in the common practice of measuring pieces of land, we would again caution the reader against his allowing a diffidence or distrust in his abilities to prevent his bestowing a very moderate degree of attention upon this subject; for we honestly assure him that it neither requires a long head nor a scientific knowledge in order to comprehend the meaning of what we further purpose placing before him.

One of the commonest, most simple, and generally useful figures is that of the trigon or triangle, a figure varying exceedingly in shape, but in every variety of form it is contained under three sides or bounding lines. When we draw or construct a mathematical

figure or diagram upon paper, we are in the habit of calling the lowest or bottom line, that upon which it appears to stand, its base, while in triangles the two remaining lines of which the figure is formed are denominated the sides or legs. But a triangle may be drawn or placed any side up, without altering the character or properties of the figure, though one of the sides should be made the bottom or base. It has already been shown, that if a line were drawn from opposite corners or angles of a square, that such a line would divide the square into two triangles,—not only similar in shape, and contained under lines of a corresponding length, but their contents would be exactly equal the one to the other also. Without attempting to make the reader acquainted (our limits not allowing it) with even the titles commonly bestowed upon the various classes of triangles, much less entering upon an explanation of their properties and geometrical principles, it may be proper to observe, as a general rule for the guidance of the reader, that in all cases, if we make or consider the longest side of the triangle the base, the content or area of such figure will invariably be exactly the one-half of the content of an oblong or long square of the same length as the said base or bottom side and of the same breadth as the triangle. In the annexed oblong figure, marked N, *r*, O, P, *s*, Q, the triangle contained under the three lines Q, *r*, P is exactly half the size of the entire figure; for if it be examined it will be found that the half of the whole triangle,



or the part Q, *r*, *s*, is equal to the part of the whole oblong N, *r*, Q, or to a fourth part of the whole oblong; and as the part of the triangle, namely *r*, P, *s*, is equal to the part of the whole figure *r*, O, P, so the two parts of the triangle, namely *r*, *s*, Q, and *r*, P, *s*, are equal to the two parts of the oblong, namely *r*, N, Q, and *r*, O, P; so that it follows that the whole triangle Q, *r*, P, is equal to half the whole oblong N, *r*, O, P, *s*, Q. In the triangle Q, *r*, P, the dotted line *s*, *r* is called the perpendicular, and is in reality the breadth; and as the base, P, Q, is equal to 40 (agreeably to the scale from which it is drawn), and the perpendicular 15 (upon the same scale), the content of the triangle would be 40×15, and divided by 2, or 600 divided by 2, or 300. And as the length and breadth of the oblong, of which the triangle forms the half, are precisely the same as the base and perpendicular of the triangle, the content of the whole figure—that is, the length multiplied by the breadth—is 600, that is, 40×15, or just double the area of the triangle.

[To be continued.]

ALEXANDRIA.

Ancient Alexandria, once the rival of Rome, and, as the emporium of the eastern and western world, a city of more extensive commerce than Tyre had ever been, was built by direction of Alexander the Great, during his visit to Egypt, about 332 years before the Christian æra. He intended it to have been the capital of his vast empire, and having opened the eastern world to commercial enterprise by his conquests, Alexandria, profiting by its position and political circumstances, rapidly rose into importance. It became the seat of the Ptolemies, the centre of learning and knowledge, and the great resort of commerce. In the year 30 before the Christian æra, Alexandria fell into the hands of the Romans, under whom it continued a flourishing city; and it afterwards formed a part of the Lower Empire. In the year 640, Egypt was conquered by the Arabs under Omar, and in 969 the Fatimite caliphs made themselves masters of the country. Alexandria had been declining ever since the Arab conquest, and the caliphs having built New Cairo and made it their capital, its importance was still further diminished. The discovery of the passage to India by the Cape of Good Hope, in 1497, effected a revolution in commerce by which Alexandria also suffered. The modern city, called Iskanderieh by the Arabs, is now the second city of Egypt, and the only seaport of any importance which it possesses. Mehemet Ali, the viceroy of Egypt, who has usurped the sovereign authority in the country, has made Alexandria the station of his fleet, and has established a naval arsenal, government warehouses, and other public establishments there. It is frequently the seat of his government, and some of his principal ministers are always resident at Alexandria.

Alexandria was embellished by the Ptolemies with works of art collected from the ancient cities of Egypt. It contained also the tomb of its founder; but of the numerous monuments of its former magnificence few remain at the present day. Only one of the two granite obelisks called Cleopatra's Needles is now standing. Its height is seventy-nine feet. The column usually called Pompey's Column stands on a mound of earth about forty feet high. Its height is ninety-four feet, including the capital, base, and pedestal, and the shaft, which consists of one entire piece of red granite, weighing at least two hundred and seventy-six tons, is about sixty-seven feet long. It was erected in honour of the emperor Diocletian, though probably not for the first time. A description of this column will be found in No. 130 of the 'Penny Magazine.' There were a number of other colossal pillars within the city. The great temple of Serapis, destroyed by the patriarch Theophilus, with the sanction of the emperor Theodosius, was at Alexandria. It was situated in the Rhacotis (marked R in the accompanying plan). The principal street of the ancient city was thirty stadia (about $2\frac{3}{4}$ miles) in length, and ran in a direction calculated to give it the benefit of ventilation by the northern winds. The island of Pharos, on which a magnificent lighthouse was erected, said to have been four hundred feet high, was connected with the mainland by a dyke called the Hepastadium. The palaces of the Ptolemies, the museum, and various temples were situated between the obelisks and Lochias, which space, with that extending towards the eastern gate (marked C), was the residence of the court and higher classes. Besides the Great Port, there was another called the Eunostus, which contained a smaller port, the entrance of which could be completely closed: no traces of it now remain. The port Eunostus and the Marcotic Lake were united by a canal; and there was a canal from the lake to Canopus, where it communicated with the western branch of the Nile. The city was supplied with river-water by means of this canal; and it was conveyed to private houses by subterranean aqueducts. Many of the ancient cisterns for keeping the Nile water are in good preservation, and the number of them in use during the French occupation was above two hundred. They form vaulted chambers coated with a thick red plaster impermeable to water, and are supported by columns which form arcades of two or three stories.

The materials of ancient Alexandria have been extensively employed in the modern city, which was built chiefly by the Arabs on the artificial neck of land which once formed merely a communication with the ancient Pharos. Its general appearance is not very striking; and although the mosques are numerous, none of them are of very superior design. Among the public buildings are the new palace, the arsenal and dockyard, the custom-house, and fortifications. The streets are narrow, and, being unpaved, are dusty in summer and in a muddy state in winter. The cisterns which supply the inhabitants with water are filled partly by the winter rains, and part of the supply is derived from the canal of Mahmoudieh. The government of Mehemet Pasha has instituted a "Commission of Ornament" for the purpose of improving the

[View of Alexandria.]

cleanliness, health, and appearance of the city. It takes measures for obtaining a free circulation of air in the streets and in private houses, and no new building can be erected without the sanction of the Board, which consists of some of the principal officers of the government and the European consuls. The Board is authorised to prevent all nuisances, and the removal of all the cemeteries beyond the walls of the city has been effected by its orders.

At the time of the French evacuation of Alexandria, in 1801, the population was estimated at about 7000; but according to Dr. Bowring ('Report on Egypt and Candia'), Alexandria contains 60,000 inhabitants, of whom 8000 are military and naval troops in the service of the Pasha, and 3000 are artisans employed in the dockyard. The bazars swarm with motley groups of Turks, Egyptians, Arabs, Greeks, Jews, and Franks of various nations.

Though not the seat of government, the situation of Alexandria is so much superior to that of Cairo for purposes of trade, that it may be considered the commercial capital, while Cairo is the political capital. Alexandria is in fact the only port of Egypt; Damietta and Rosetta being very imperfect outlets for the produce brought by the Nile. All the products intended for foreign export are conveyed by this channel to Alexandria, where it can at once be shipped for foreign markets. The Mahmoudieh canal, which was restored and completed by Mehemet Ali in 1819, joins the Nile at Atfeh, about forty miles distant from Alexandria. Here goods and passengers from or to the latter place are transferred to other boats, though there are sluices by which transhipment might be avoided, but they are seldom used. Before the canal was reconstructed the produce of the interior was brought to Alexandria by Rosetta, where the mouth of the Nile was sometimes impassable for a couple of months in winter. An account of this canal is given in No. 452 of the 'Penny Magazine.' The traffic between Alexandria and Cairo, a distance of about one hundred miles in a direct line, is by this canal and the Nile; but it is often attended with tedious delays. Boats are not always to be obtained at Atfeh, as orders from the Pasha may have caused them to be taken for the public service. The Nile is also exposed to sudden squalls; and the general direction of the winds is exactly contrary to the current; and though the Arabs are good boatmen, the passage sometimes occupies a fortnight. As might be expected in a country in which improvements, instead of being developed by internal wants, have been forced into existence by the energy of one individual, there is a want of natural order in the changes which Mehemet Ali has introduced. Thus he has a line of telegraphs between Alexandria and Cairo, while there is not a road calculated to facilitate and encourage traffic. The daily post between Cairo and Alexandria conveys letters in from thirty to thirty-six hours, but it is chiefly for the use of the government, and the merchants are under the necessity of establishing a post of their own, which is expedited three times a week.

The exports of Egypt, which are almost wholly shipped at Alexandria, consist of the following articles, enumerated in the order of their value:—Cotton-wool, gums, rice, linen, skins, incense, flax, cotton twist, corn, linseed, elephants' teeth, senna, saffron, and tortoise-shell; but one-fifth of the articles exported being classed as 'sundries' in Dr. Bowring's Report, we are unable to designate them. In 1831 the greatest amount of exports was to Turkey, and next came Austria, Great Britain, Tuscany, and France. Since 1831 the trade with England has been increasing, and that with Turkey and Tuscany has declined. In 1831 the imports were largest from Turkey, Austria, and Tuscany; after which came England and France. A fourth of the imports are not classed under separate heads, but the following are the other principal imports in the order of quantity and value:—Wood, cotton goods, silk goods, iron, tarboushes, hardware and cutlery, paper, sugar, wine, and spirits. The number of vessels which entered the port was 523 in 1837, and the number of departures was 379: of the latter, 32 were for England, all for Liverpool, with one exception; and of the former, 11 were from London, 10 from Liverpool, and 28 from Newcastle.

Alexandria is at present an important station in the line of communication with our Indian possessions. The mail from Falmouth has been landed at Alexandria in less than fourteen days, and it is then dispatched by the Mahmoudieh canal, the Nile, and by Cairo to Suez, when it is conveyed by the Red Sea to

Bombay. Coal is sent from Cairo to Suez by camels, each of which carries a burden of six hundredweight; and the supply for the steamers is 2700 tons per annum, all of which has to be conveyed by this laborious process. If a canal or railway were constructed between Suez and the Mediterranean, Alexandria would be left out of this line of communication with the East, which is daily becoming of greater political and commercial importance. Six steam-boats visit Alexandria monthly, namely, three from Marseille, one from England, two from Trieste, and one from Constantinople.

[Plan of Ancient and Modern Alexandria.]

HORSE ARMOURY IN THE TOWER.—XV.

Henry, Prince of Wales, 1612; George Villiers, Duke of Buckingham, 1618; Charles, Prince of Wales, 1620.

Henry, Prince of Wales. The armour to which the name of this prince is affixed is a fine tilting-suit, elaborately engraved with warlike subjects, richly gilt. There is every probability of its being one of the suits actually worn by him in some of those tilting-matches in which he so much delighted, and which the visits of several foreigners of distinction, during his father's reign, gave him opportunities of getting up with great splendour.

The untimely death of this young man, whose conduct in the high station which he occupied promised so much for the welfare of the kingdom when he should be called upon to assume its government, gave a heavy blow to the expectations of the people, by whom he had been almost idolised. Even at the present day, after the lapse of more than two centuries, we cannot help feeling a mournful interest in the fate of one who, heir-apparent to so much greatness, lived long enough to show himself deserving of all the honours that he seemed born to, but not long enough to enjoy them.

Henry was the eldest son of James I., and was born in Sterling Castle, Scotland, February 19, 1594. He was committed to the care of the Dowager Countess of Mar, and, when six years of age, removed to the custody of Adam Newton, a learned Scotsman, from whom, however, he does not appear to have imbibed any very great relish for learning; but we are informed that at a very early age the natural greatness of his character made itself apparent, that he manifested on several occasions a great degree of courage and fortitude, and evinced a partiality for manly and warlike amusements above his age. La Bodière, ambassador from Henri IV. of France to James, thus writes of him:—"None of his pleasures savour in the least of a child. He is a particular lover of horses and what belongs to them, but is not fond of hunting; and when he goes to it, it is rather for the pleasure of galloping than that which the dogs give him. He plays wittingly enough at tennis, and at another Scottish diversion very like mall, but always with persons older than himself, as if he despised those of his own age. He studies for two hours every day, and employs the rest in tossing the pike, leaping, shooting with the bow, throwing the bar, vaulting, or some other such exercise, and is never idle." Though he only studied two hours every day, he contrived to make himself well acquainted with most things connected with the government of a great country, which it seemed probable that in the course of nature he would soon be called upon to superintend. His conduct was regulated not so much by the usages of society as by the principles of right and wrong which his religion taught him, and which his abhorrence of the least approach to hypocrisy led him to practise. Such was his intense love of sincerity, that he could not endure even the innocent and usual fallacies of polite intercourse. Sir Charles Cornwallis, whose book appeared shortly after the death of the prince, informs us, that having laid before him, for his signature, a letter to a nobleman of whom he had no good opinion, which ended with some common-place expression of favour, the prince commanded him to make another copy, the concluding words of which he dictated himself, saying that his hand should never affirm what his heart did not feel. His temper was naturally very haughty, but the mildness of his disposition and the excellence of his understanding taught him the necessity of curbing it, and it was rather from a degree of constraint in his manner, which he could not entirely overcome, than from any word or action, that such a characteristic could be inferred. He was kind and faithful to his dependants, and supported their interests with a zeal which seldom failed of success. At the time he was created Prince of Wales, which was on the 4th of June, 1610, when he was in his sixteenth year, he had acquired such habits of prudence and economy, sweetened however by a liberal disposition, that his household (which consisted of more than six hundred persons) was regulated with a preciseness which offered a great contrast to the government of his father's court; and by which he was enabled so to rule his expenses, that they were always within his income, a degree of prudence for which it would be difficult to find a parallel in the history of princes. He had chosen as patterns for his conduct the good qualities of Henry V. and Edward the Black Prince, whose warlike dispositions and open and ingenuous minds he greatly admired; but, unlike some who have chosen similar examples for the regulation of their conduct, he did not choose to imitate anything that should be censurable in their actions. As he approached to manhood, he had made himself master theoretically of the art of war; and may be said in some degree to have practised it, as he could execute in the field the manœuvres he had learned in his study, could perform all the duties of a common soldier, was well versed in all warlike amusements, and would frequently walk fast and far to accustom himself to long marches. He was also critically versed in all that related to the navy, even to the most minute circumstances of ship-building, and never failed to make himself acquainted with and to patronise all new inventions or discoveries likely to be of utility to the military or naval service. But in the arts of peace he took scarcely less interest, the professors of sculpture, architecture, carving, painting, &c. looking up to him as their protector. Music he himself practised with success.

His discretion, temperance, economy, and the wisdom displayed by him in the conduct of his own affairs, pro-

mised so much when he should succeed to the throne, that no heir-apparent was ever perhaps so popular. These good qualities, however, "acting (as one of our historians observes) with the effect of satire and reproach on the contrary disposition of the king," induced a degree of jealousy in the breast of that monarch, which would occasionally break out in some testy expression.

The court of the young prince was well attended, and with people of so different a class from those who frequented the court of the king, that James had exclaimed, "Will he bury me alive?" a question which he scarcely thought figurative. But whatever suspicions James may have entertained with respect to the growing popularity of his son, his fears and the people's hopes both suddenly received a check which seems never to have been contemplated by any but Prince Henry himself. This was the illness of the prince, which, occasioned at first by the fatigue of hard travelling in attending one of his father's progresses, quickly assumed a serious character, and in a short time put an end to his life, while his physicians were debating whether he should or should not be bled, a question which, at the present day, would never be raised in a case of serious fever such as that under which the prince was suffering. At the conclusion of the account of his death, in the 'Pictorial History of England,' as collected from various sources, the following details are given:—"His head frequently wandered, but on the night of the 2nd of November his delirium increased alarmingly: he called for his clothes, for his armour and sword, saying he must be gone. On Thursday, the 5th of November, the anniversary of the gunpowder plot, the king was informed that there was no hope. Upon this, James, who had visited him several times at St. James's, 'being unwilling and unable to stay so near the gates of sorrow, removed to Theobalds in Hertfordshire, to wait there the event.' Abbot, the archbishop of Canterbury, attended the prince, told him of his danger, and took his confession of faith. In the course of that day the prince repeatedly called out 'David!—David!' meaning Sir David Murray, his confidential friend and servant; but when Murray stood by his bedside, he always answered with a sigh, 'I would say something, but I cannot utter it.' During that night he made many efforts to speak on some secret matter which seemed to press heavily on his heart, but he could not be understood by reason of the rattling in his throat. Sir David Murray, however, contrived to understand his earnest wish, that a number of letters in a certain cabinet in his closet should be burnt. It is said that these letters were burnt accordingly. . . But the sufferer was now past cure and help, and he expired at eight o'clock that night, being Friday the 6th of November, 1612. He was eighteen years, eight months, and seventeen days old." Sir Charles Cornwallis has given the following sketch of his person:—"He was of a comely, tall, middle stature, about five feet eight inches high: of a strong, straight, well-made body, as if nature in him had showed all her cunning; with somewhat broad shoulders, and a small waste; of an amiable majestic countenance, his hair of an auburn colour, long face and broad forehead; a piercing grave eye, a most gracious smile, with a terrible frown."

Though we would fain imagine that, had he lived, the principles he had advocated as a prince would have been supported by him when king, the instances are so rare in which a perfect consistency of character has been maintained through life, that it may be doubted whether, when called to a higher sphere of action, and obliged to pay great deference to conflicting interests, he would not have been in some danger of losing his prudence, his mildness of disposition, his love of sincerity, and other virtues for which we now honour him. It should be remembered also that he had a considerable share of that pride and obstinacy which led others of his family, before and after him, into so many ruinous errors.

George Villiers, Duke of Buckingham, 1618. Of this unworthy but fortunate favourite, and not the less fortunate that his death was such as to excite commiseration for a man who otherwise would have gone to his grave amid the curses of the people, we need not say much. The power he obtained over the mind of James I., the favour he enjoyed then and afterwards from his son Charles, and the almost unprecedented accessions made to his rank and fortunes, without any mental qualifications to excuse them, and indeed indebted for them only to a fine person and a graceful address, combined with the personal accomplishments which he had acquired during a long residence in France, have rendered his name too familiar to need a lengthened account of his life on the present occasion.

Though he was brave, and understood all the warlike amusements of the age, yet he knew nothing of the art of war, and when he engaged in it, proved his incapacity for command. He was doubtless first among the gallants of the courts both of James and Charles I., and the qualifications which might be spared in the minister sat well upon him when he took part in the festivities of the court.

The romantic expedition which he undertook into Spain, in company with Prince Charles, has been attributed to his jealousy of the earl of Bristol, who was then conducting the negociation with reference to the marriage of the Prince with the Infanta. Of this expedition we shall shortly give some account, and till then take leave of his grace of Buckingham.

Charles, Prince of Wales, 1620. Charles, the second son of James, was born at Dunfermline in Scotland, November 19, 1600. His early childhood was sickly, and he was afflicted with so much bodily weakness, that his limbs performed their functions with difficulty. The care of his infancy was entrusted to the lady of Sir Robert Cary, and at six years of age he was placed under the tuition of James Murray, a Scot of extensive erudition. As he could not take part in any active exercises, he naturally devoted much of his time to study, and acquired rapidly a considerable knowledge of the learned languages. As he grew up, his weakness left him, and at the time he was created Prince of Wales, in 1616, he was in full possession of health and strength, and excelled in the bodily exercises by which young noblemen then amused themselves. It has been mentioned particularly that he was the best marksman and the best rider of the day. He passed his youth in the amusements of the court, taking little part in politics, nor interfering in the events of that caballing period, until his twenty-third year, when, on the occasion of his projected marriage with the Infanta, he listened to the advice of Buckingham, and "with more than Spanish gallantry, but less than Spanish prudence," determined to visit his intended bride without letting the world know of his intention.

Having, with some difficulty, obtained his father's leave, he left the court privately on the 17th of September, for Newhall in Essex, the seat of the marquis of Buckingham. Then, having provided themselves with disguises, with false hair and beards, they took their departure the next day, accompanied only by Sir Richard Graham, Sir Francis Cottington, and Endymion Porter.

The prince assumed the name of John Smith, and Buckingham that of Thomas Smith, and with these travelling names they thought to escape detection, but their bearing and liberality almost discovered them in more than a single instance. On ferrying over the river near Gravesend, they found themselves without silver; and the piece of gold, worth twenty-two shillings, which they presented the boatman with, created so much suspicion, that he, feeling a misgiving as to their quality, and thinking them gentlemen going beyond sea to settle some quarrel, gave information to the officers of the town, who sent orders to stop them at Rochester. They had passed through

that city, however, before the intelligence arrived; but on the brow of the hill they encountered the French ambassador, well attended, and in one of the royal carriages. This difficulty they escaped by quitting the high road, and "teaching their post-horses to leap hedges." By this time the mayor of Canterbury had received information, and he sturdily detained them till the marquis thought it best to dismask his beard, and so told him that "he was going covertly to take a secret view, being admiral, of the forwardness of his majesty's fleet, which was then in preparation on the narrow seas." Having experienced some few more interruptions of a similar character, which, however, they contrived to free themselves from, they at length arrived at Paris on their way to Madrid. At Paris they got admission to the palace as strangers, and saw there the king in his gallery after dinner, as well as the princess Henrietta Maria, and the ladies of the court at a masque in the evening.

They only made a stay of one day, continuing their journey with the greatest celerity. They had hitherto experienced only trifling interruptions to their journey, but at Bayonne, the last town on the frontier adjoining Spain, they were subjected to a rigorous examination by the governor, who suspected they were not the 'Smiths' they represented themselves to be, and it was with great difficulty they got permission to proceed. They had not left the town many hours when a courier arrived on his road to Madrid, bearing dispatches from the Spanish ambassador in London to his government, informing them of the departure of the prince, and the supposed object of their journey. At the close of the evening of that day, two mules stopped at the earl of Bristol's house in Madrid. The riders alighted. Mr. Thomas Smith went in first with a portmanteau under his arm; and then Mr. John Smith, who stayed awhile on the other side of the street in the dark, having charge of the mules, was sent for. When the diplomatist recognised in this John Smith the heir to the English crown, and in Tom Smith the Marquis of Buckingham, he stared as if he had seen two ghosts; but presently he took the prince up to his bed-chamber, where he wrote a letter, and dispatched it by a courier that night to inform the king of England how his son, in less than sixteen days, had arrived safely at the capital of Spain.

The visit was announced privately the next day to the king of Spain, who immediately sent his favourite, D'Olivares, to welcome the prince; and at ten o'clock at night the king himself arrived in his carriage to pay him a visit. The news soon spread that the Prince of Wales had come to Spain privately to pay his addresses to the Infanta in person; and the gallantry of the act, according so well with the romantic disposition of the people, was applauded to the skies. The crowd was so great the next day around the Earl of Bristol's house in order to see the prince, that the latter was frightened to ride out; so dressing up one of the earl's gentlemen to represent the prince, they sent him out in the carriage, which the people crowded after. Mr. John Smith, the real prince, then entered a private carriage with the Earl of Bristol and two other gentlemen, and drove to the Prado, where they stayed till the king came to take the air. His majesty was accompanied by the queen, his two brothers, and the Infanta, who wore a blue riband on her arm, of purpose (says Howell, in his 'Letters from Spain,' written at the time) that the prince might distinguish her. As soon as the Infanta saw the prince, her colour rose very high, "which we hold to be (says the same authority) an impress of love and affection, for the face is oftentimes the true index of the heart." "The people here (he continues) do mightilie magnifie the gallantry of the journey, and cry out that he deserved to have the Infanta thrown into his arms the first night he came." The prince was provided with attendants by the king of Spain, and as soon as apartments could be prepared for him in the palace, he was accommodated there with great splendour. Many noblemen also arrived from England, and attaching themselves to the prince, he soon saw himself surrounded by as gay a court as that he had in England.

Fêtes and all manner of sports were provided, and Madrid became so gay that it seemed to the sober Spaniards as though they were transported to another country. As the prince excelled in all manly exercises, he maintained the high place in the opinion of the Infanta which his presence had excited, and it is recorded that being invited to run at the ring, when his fair mistress was a spectator of the sport, he did, "to the glory of his fortune and the great contentment of himself and the lookers-on, take the ring at the very first course."

But notwithstanding the Infanta expressed her attachment, and the prince was no way behind the other gallantry of this gay period, such was the strictness of Spanish etiquette that the lovers found it impossible to hold any converse except in public and in the presence of the king. That the prince did not neglect any opportunity to press his suit with the Infanta, the following passage from Howell may sufficiently prove:—

"Not long since the prince, understanding that the Infanta was used to go some mornings to the Casa de Campo, a summer-house the king hath t'other side the river, to gather May-dew, he did rise betimes and went thither, taking your brother (Endymion Porter) with him. They were let into the house and into the garden, but the Infanta was in the orchard, and there being a high partition wall between, and the door double-bolted, the prince got on the top of the wall, and sprung down a great height, and so made towards her; but she spying him first of all the rest, gave a shriek and ran back; the old marquis that was then her guardian came towards the prince, and fell on his knees, conjuring his highness to retire, in regard he hazarded his head if he admitted any to her company; so the door was opened, and he came out under that wall over which he had got in."

Charles remained in Spain seven months, being splendidly entertained during the whole period; and when at last he took his departure, he was accompanied by the king as far as the Escurial (in which palace a collation had been prepared for him and his suite, in character with the magnificence of the place); and by Gondomar, several of the principal ministers and grandees, and a long train of courtiers, as far as the sea-side.

His father did not live long after his return, and on the 27th of March, 1625, Charles ascended the throne.

As we shall have shortly to speak of him as king, we shall now close this rather long article.

Influence of the Seasons on Health.—The seasons, which exercise such a striking influence upon the vegetable kingdom, influence the diseases of the human race. The reduction of temperature alone, when the atmosphere reaches the freezing-point, is fatal to a certain number of persons; at the same time many artisans are thrown out of employment, the small earnings of the poorer classes are diminished, and, as fuel is dear, the air, to exclude the cold, is shut out of their dwellings, until it becomes highly insalubrious. Warm weather creates a demand for labour out of doors, and excites all the functions when it is not carried to excess. As the temperature advances, and autumn comes on, dead vegetable and animal matter undergoes rapid decomposition. the living are infected; and, where the miasmata are concentrated in cities, or in undrained lands, remittant fevers, dysenteries, plagues, and malignant maladies are generated. —*Mr. Farr's Letter to the Registrar-General.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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BRITISH AGRICULTURE.

NOVEMBER.

[Emblems of November.—From Saxon Calendars. Farm-house Fire; Cotton MS., Tiberius, B. 5. Threshing; Lansdowne MS., 381. Killing Swine; Cotton MS., Nero, C. 4.]

Notwithstanding that this is what has been proverbially styled "the gloomy month of November," the application of the term seems to be more directly intended for our towns and cities, where the fogs and rains which frequently occur about this period are presumed to have a baneful influence upon the atmosphere, than for that portion of the population engaged in agricultural affairs,—or, indeed, for the country at large. The labourer, whose general out-door employment necessarily exposes him to the pelting of the storm, is rarely known to despond; and if he continue to enjoy robust health, he cares but little for the inclemency of the season: indeed many such persons prefer the winter to the summer season, and suffer less personal inconvenience from the winter cold than the summer heat. It does not, however, invariably happen, in spite of the near approach of what may be termed absolute winter, and the indifferent reputation that is commonly attached to the present month, that the weather is unfavourable for farming operations; for there are autumns when this month is a more favourable one than its predecessor. This, however, can in nowise be depended upon, and it therefore behoves the husbandman to defer as few of those necessary farming affairs as possible, which annually devolve upon him during the autumn, until so late a period of the season as the present.

One of our most celebrated modern poets draws the following striking picture of the present month, as seen and felt in the more northern portions of our island:—

"November's sky is chill and drear,
November's leaf is red and sear:
Late gazing down the steepy linn,
That hems our little garden in,
Low in its dark and narrow glen,
You scarce the rivulet might ken,
So thick the tangled green-wood grew,
So feeble trilled the streamlet through:
Now, murmuring hoarse, and frequent seen
Through bush and brier, no longer green,
An angry brook, it sweeps the glade,
Brawls over rock and wild cascade,
And, foaming brown, with doubled speed
Hurries its waters to the Tweed.

No longer autumn's glowing red
Upon our forest hills is shed;
No more, beneath the evening beam,
Fair Tweed reflects their purple gleam;
Away hath passed the heather-bell,
That bloomed so rich on Needpath-fell;
Sallow his brow, and russet bare
Are now the sister-heights of Yare.
The sheep, before the pinching heaven,
To sheltered dale and down are driven,
Where yet some faded herbage pines,
And yet a watery sunbeam shines:

In meek despondency they eye
The withered sward and wintry sky,
And far beneath their summer hill,
Stray sadly by Glenkinnon's rill:
The shepherd shifts his mantle's fold,
And wraps him closer from the cold;
His dogs no merry circles wheel,
But, shivering, follow at his heel;
A cowering glance they often cast,
As deeper moans the gathering blast."*

Late as the season has now got, and harsh and cold as the weather frequently happens to be, it seldom is the case that the autumnal seed-time is completed until the present month; but, indeed, some farmers who occupy large farms upon which is a great diversity of soil and situation, will often be found sowing corn, of one sort or another, during the whole of the autumnal and winter months (excepting perhaps January), at such times as the weather will permit of the seed being got into the ground in tolerable condition. Without attempting to uphold the practice of what we should call sowing out of season, we will mention a circumstance which occurred under our own personal observation. A farmer, having eaten off a turnip crop by the early part of December, and the weather proving dry and favourable, came to the resolution of ploughing up the field at once, and trying the effects of this unusually late sowing. He did so; but it so happened, that on the very day that he expected to have finished the work a snow-storm set in during the afternoon, and after the sowing had been completed, of so violent a character as to render it impossible to continue the harrowing; and, consequently, upon two or three acres the seed was left uncovered. A season scarcely ever equalled for severity in this country succeeded this fall of snow, which continued for two days with but little intermission; so that on the third day there was a covering upon the ploughed ground of twelve or fifteen inches. Although partial thaws took place, and fresh accumulations of snow succeeded, the ground was never actually bare for upwards of two months; when, instead of the seed having rotted, as the farmer supposed might be the case, he was surprised to find that the portion of the ground which had not been harrowed bore a more favourable appearance than any other part of the field; the seed no doubt having, when the first partial thaw took place, sunk sufficiently into the surface of the soil to vegetate; and the vegetation had probably been increased by the covering of snow that afterwards continued upon it, and thus protected the young plants from the effects of the cold.

In the upland and mountain regions of country, where numerous flocks of the hardy black-faced breed of sheep are kept, the salving or smearing of them commonly occupies the sheep-farmers three or four weeks, commencing in the latter part of October and ending some time during the present month; and scarcely does there a busier season occur during the whole year. It is not only a busy season, but one also that is attended with very great expense to the large stock-keeper; for besides the considerable cost of the materials employed in making the salve, there is the amount of the wages of those persons it may be necessary to employ during the time the salving is in progress. Many of the mountain flocks vary from two to four thousand, so that were we to take the average at three thousand, the expense of salving would be very considerable. The salve, for the most part, is made of melted butter and tar,—the respective proportions of which depend, in some measure, upon the judgment of the parties using it—as every sheep-farmer prepares his own salve; but twelve pounds of butter to a gallon of tar may be considered as rather an under than an over estimate. The best quality of butter is not generally used; and occasionally palm-oil is made use of as a cheap substitute for butter, but the salve made in this way is not held in such repute. The cost of the salve applied to each sheep will average (in most seasons) something over four-pence; and the wages of the salvers cannot be estimated under twopence,—for the usual rate of wages is from one shilling to sixteen pence per day, and board, or at the very lowest calculation two shillings; and where a person salves the sheep well and neatly, he must be very expert indeed at the business if he salves over a dozen during a short autumnal day. Hence it will appear that the material and the wages together ought not to be estimated under sixpence a head, perhaps a little over; so that the cost of salving a flock of three thousand small mountain sheep could not be less than from 75*l.* to 80*l.* But there is a good deal of extra labour consequent upon the season of salving the flocks, that is not taken into this account; for the whole or large portions of the flocks have to be gathered in from the extensive wastes and commons, according as they may be required to be put into the hands of the salvers; and when they have been salved, they have to be distinctly re-marked—which is commonly done with both tar and rud or ruddle. It is at this particular season that assortments and selections are made through the flocks; for the old crocks, or 'crones,' are drafted, and sent off to the country fairs to be sold for what they will fetch; while the ewes that are intended for breeders are henceforward kept apart from the rest of the flock, and are not sent back to the mountains, but, accompanied by the rams, are sent off to such pastures or enclosures as the farmers may happen to be possessed of. Besides which the hogs or hoggets—for the produce of last spring ceases being called lambs at this season—are after salving sent off to some distant part of the country, where winter eatage has been provided for them; for they are not considered sufficiently hardy to withstand the rigours of the winter among the mountains, unless provided with sheds to shelter them from the tempest and the cold, and are well supplied with choice hay, where more succulent food is not obtainable.

The expenses attending the keeping of a large flock of mountain sheep—from the time the hoggets and the ewes and lambs are returned to the commons late in the spring, until the present season of the year, when the flocks are again gathered in for the purpose of being salved—is but trifling; since in most situations where these numerous flocks are kept, the occupiers of the farms adjacent possess an unlimited right of pasturage upon the unenclosed wastes; nor do these sheep-farmers generally rent high. So that it is no unusual thing with the occupier of a farm of one hundred and fifty or two hundred acres, a considerable portion of which is often but little superior to the common itself, to possess a flock of three or four thousand sheep; the chief expense being the wages of a couple of shepherds, and the loss sustained in the various casualties attending so numerous a flock. But with respect to the winter season the case is quite different; for in the first instance there is the expense of salving, as already mentioned,—then the winter pasturage of the young sheep, and probably a large portion of the ewes; and should the season be a severe one, the stronger and more hardy portion of the flock, although sent back to the mountain wastes to seek a miserable pittance, will have to be supported—at least in part—with hay, during the more inclement part of the season. It is at this season, too, that the owners of the large flocks commonly get the most correct account of the exact numbers under the various heads they generally class them; for although an account is commonly kept of the numbers shorn, they are not then so accurately classed and subdivided. Where the wastes are very extensive, and probably some portions of them rugged and broken, and the flocks large, it often happens that a few stragglers will escape the observation of the persons employed in collecting the flocks together, and consequently escape the

* Walter Scott's Introduction to 'Marmion.'

operation of salving. These, from their appearance during the winter, are familiarly termed *white* sheep, for the salve gives a dirty and impure appearance to the fleeces, and it is never applied to the skins of those that are under progress of fattening, for it is considered to impart an unpleasant flavour, in a greater or less degree, to the flesh of those that have been anointed with a salve made of such ingredients.

This salving or smearing has been objected to by the owners of large flocks of sheep, but then they have not been of the same breeds we here allude to; for it only requires a strict observance of the salved sheep, and the *white* sheep that have escaped salving, to become fully satisfied of the general utility of annually incurring both the expense and trouble. In the first place, it has the effect of destroying many of the lice with which sheep in general are infested; secondly, it quickens and increases the growth of wool, and thereby renders the fleeces a warmer covering and of greater value; and thirdly, it prevents the wool from becoming detached from the skin, and so falling off in the early part of the ensuing milder season, thus preventing a loss in that valuable article, which, among the mountain flocks, would most certainly take place to a very great extent were they to remain unsalved; so that these advantages greatly overbalance the amount of expense incurred in salving.

It appears from the writings of various authors upon rural economy, that most of the farmers used formerly to depend, more or less, upon *mast* for the fattening of their pigs or hogs at this season of the year; and what appears to have been generally understood by this term comprehended all sorts of haws and hops, acorns, sloes, beechnuts, &c.; in short, all the wild fruits of the woods and hedge-rows that hogs are disposed to feed upon. Some of the same authors allege that the wild productions here spoken of fatted hogs as readily, and produced pork of as good a quality, as beans, peas, or corn would have done. This, however, notwithstanding all that may have been said and written to the contrary, we cannot altogether credit; for there is no doubt whatever that the fat of bacon or pork that has been fed upon acorns and nuts is invariably of an oily nature, and by no means of so fine a flavour, or so valuable for general consumption, as that which has been fattened upon the various productions of the farm, and particularly upon the meal made from oats or barley. But under the wretched condition in which agriculture for the most part existed a century or two ago, farm products were by no means so various or abundant as they are at present; and hence the different sorts of mast were eagerly sought after, and held in good repute. Even as early in the season as the month of September, our friend Tusser thus refers to the subject of securing mast:—

> "Go gather some mast, it will stand thee upon,
> With servant and children, ere mast be all gone;
> Some left among bushes shall pleasure thy swine;
> For fear of mischief, keep acorns from kine."*

There seems no doubt that before Tusser's time, as well as at a somewhat more recent period, the keeping of swine was a matter of far more general importance than it is at present. In those days there was scarcely a village or hamlet which did not possess a swineherd, a person maintained at the expense of the whole community, for the express purpose of taking care of the hogs or swine. The chief duties of this personage were to collect them from the various parties to whom they belonged, in the mornings, and drive them to the woods or commons, or to wherever feed happened to be most abundant, where they were permitted to roam at large for the day; when towards evening, they were again collected into a body, and driven back to the village and deposited with the respective owners. The swineherd, however, was a character confined to situations where woods and copses abounded; for in the absence of woodlands and commons, briers and brakes were in plenty: there was but little to be procured in this foraging system by the herds of swine, and consequently no need of a swineherd.

Since the period that the swineherd figured as a necessary character in many localities more or less populous, a large portion of the forests and more extensive woods have become disforested, and most of the wastes and common lands have been enclosed. But since farming affairs have become reduced to a more regular and perfect system, it has been found that hogs generally ought to be restricted from roaming at large; and although in a few instances we yet occasionally find some extensive occupier of woods and copses sending a party of hogs into the woodlands at the season when mast is most abundant, with a boy to look after them, generally speaking they are too apt, by their proneness to rooting up grass and plants, and peculiar manner of feeding, to commit serious injuries upon young woods, as well as upon farm-crops in general. But a better and more profitable plan is now adopted by most farmers disposed to make the rearing of swine an object of profit to any amount, and that is, by having a clover-field of the requisite size set apart for the feeding of hogs; for it has been fully ascertained that hogs of certain breeds may be maintained or fed upon clover (of which they are very fond) at a much less expense than in any other way, and yet kept in good condition.

It seems to have been known, even in Tusser's time, that some sorts of mast were not wholesome food for hogs when consumed in large quantities; for in speaking of their being fed upon acorns, he says:—

> "Though plenty of acorns the porking to fat,
> Not taken in season may perish by that;
> If rattling, or swilling, get once to the throat,
> Thou losest thy porkling, a crown to a groat."*

Our author, in a subsequent paragraph, in speaking of hogs becoming infected with a distemper called the measles, in which their skins become covered with an irruption of red spots (which is generally believed to originate in the absence of a proper supply of water), expresses himself in a manner that is by no means in accordance with the honourable and moral principles inculcated throughout his writings; for the following extract will show how he proposes disposing of his diseased hogs:—

> "Thy measled bacon-hog, sow, or thy boar,
> Shut up for to heal, for infecting thy store;
> Or kill it for bacon, or souse it to sell,
> For Fleming that loves it so daintily well."*

It appears to us on the whole, however, that less use is now made of the various kinds of the wild productions of the woods and hedge-rows, or what is generally included under the head of *mast*, than what prudence and economy would at all times appear to dictate; for in seasons like the present, when mast is very abundant and farm-produce dear, where there are woods or hedge-rows connected with a farm, and conveniently situated, by a little good management the stock of swine, both those that are intended for fattening during the winter, as well as the younger ones which are to be kept over the following summer, might be greatly improved in condition where the mast is abundant. And although, as we have hinted elsewhere, mast-fed pork or bacon is certainly not of the best quality, yet this species of food answers exceedingly well to improve the condition of lean store hogs until they become about half fat, when the fattening process should be completed by such farm-produce as it may be the most convenient to supply at this season of the year; and were the whole business judiciously managed, a saving of one-half the meal or corn that otherwise would have been consumed might be effected in this way, without the quality of the pork being at all deteriorated. In Tusser's

* 'September's Husbandry.'

* 'October's Husbandry.'

'Abstract' of the present month, the following quotation would apply to what we have just been speaking of:—

"Get pole, boy mine,
Beat haws to swine;
Drive hog to the wood,
Brake roots be good."

It was remarked in an early supplemental number for the present year, that the season of Christmas, or a little earlier or later, is the usual period for the slaughtering of hogs and the curing of bacon; but in several counties, where but little bacon is used, they commonly have their porkers sufficiently fat for slaughtering some time during the present month, the farmers alleging that it is more profitable to fatten their hogs as soon as the crops are gathered in, when there commonly happens to be some portion of them that is not of a marketable quality, and only, in fact, fit for hog-meat; and hence a longer delay in getting such articles consumed, would in all likelihood lessen its value; and when once it is found that the hogs have consumed the store thus set apart for them, it rarely happens that it would prove profitable to keep them longer, as whatever they then consume in addition might easily be converted into cash at a fair and marketable price. But in most cases, circumstances will direct the farmer in matters that appertain to the fattening of the various kinds of stock; and as the season has commonly become so cold by the beginning of the present month, that there ceases to be any longer a risk in committing the carcasses of bullocks or swine to the pickling-tub, and as very cold weather is known to be detrimental to the fattening of farm-stock in general, where it is intended for family consumption, in most cases early slaughtering will prove the more advantageous. This seems to have been the view that was generally entertained, at least in reference to beef, in Tusser's time, when it was the custom with the farmers to kill their own supply for the ensuing season; and although the turnip culture has made the fattening process, after the summer grass is gone, a matter easily accomplished to what it was formerly, still the general principle will commonly hold good:—

"At Hollontide slaughter-time entereth in,
And then does the husbandman's feasting begin;
From thence until Shrovetide kill now and then some,
Their offal for household the better will come."*

And again:—

"(For Easter) at Martelmas, hang up a beef,
For stall-fed, and peas-fed, play pick-purse the thief;
With that and the like, ere an grass-beef come in,
Thy folks shall look cheerly when others look thin."*

For the sake of the health of the rural population, on the whole it is probably better that the constant use of salt provisions no longer obtains, for beef that has been salted and dried, as well as that which remains a long time in pickle (and the same may be said of pork too), on account of its saltness and hardness, becomes very indigestible. To be sure, those persons whose occupations are daily in the field, from their general habits and the nature of their exercise, are rarely subject to suffer much inconvenience in this respect.†

At this period of the year the season returns when those persons who are occupiers of woodlands should set about having them carefully looked after, for the trees becoming divested of their leaves, in situations where a culling is necessary, or where the whole is intended for sale, now is the season when the woodman may again resort to his winter employment; and since many of the labourers employed during the summer in the ordinary duties of the farm—in the sowing, planting, weeding, reaping, harvesting, and securing of the crops, where farms have woodlands attached to them—such labourers may now lay aside for a season their hoes, their sickles, and their spades, and take up the axe and the bill-hook. Some writers upon agricultural affairs have totally excluded the management of woodlands, as not properly coming within the range of their general remarks; but this undoubtedly is an incorrect view of the matter, for plantations and woods, particularly while the trees are young, demand from those who expect ultimately to be benefited by them a constant care and superintendence, without which success is more or less doubtful. Besides the necessary pruning and thinning that young plantations require, especial care should be taken to prevent the leading shoots from being torn off by cattle, and those sorts that have smooth barks from being injured by sheep. These things can only be prevented by an unceasing attention to the state of the fences, and the period is now commencing when that crying nuisance to farming, the hunting season, begins. There is, however, one class of depredators upon young trees and plantations that it is next to impossible to guard against—we refer to hares and rabbits, which, during the winter season, often inflict incalculable injury by barking and cropping the young plants and tender saplings. Sheep too, in severe frosty weather, have been known to ruin young woods and plantations by barking the trees; even the young fruit-trees in an orchard are not safe, should the cold be severe and the ground covered with snow: we ourselves have witnessed in one apple-orchard, during a single night, four hundred young trees destroyed in this way.

Many persons appear to entertain the opinion that there are but comparatively few situations where the soil is of a nature at all calculated for the growth of the more useful sorts of timber-trees, without themselves understanding almost anything of the nature or cultivation of timber generally, or apparently without knowing, or at least bearing in mind, the fact, that in former ages vast and extensive forests existed in various parts of the country where now there is not so much as an aged thorn-bush or a stunted mountain ash or birch to be met with, and in situations too that are so exposed and bleak, and the soil so indifferently calculated for ordinary farming purposes, that those very lands which, some centuries ago, were tolerably productive as forests, are permitted to remain in a state that renders them almost entirely worthless. Upon such lands, and in many other situations where timber is not known ever to have grown, thousands of acres might be found which, by judicious treatment—that is, by planting the sorts of trees for the growth of which the soil is best adapted, and by securely fencing them in and paying all necessary attention to the plantations while young—might be brought to realize to their owners five or ten fold they at present derive from them. Of course we would not be understood as advocating a universal system of planting—a conversion of whole districts of country, or even of entire farms, at present in a favourable state of tillage and productiveness, into woods and plantations. Our observations are intended to apply generally to waste and unproductive soils, which, in order to be ever reclaimed so as to produce

* 'November's Husbandry.'

† In the northern and middle sections of the United States, as well as in some of our adjoining colonies, the woodcutters and others, who may be looked upon as the peasantry of those countries, greatly prefer salted pork, at any season of the year, to fresh provisions of any description. They seem to be of opinion that when they can get plenty of well-fed and well-cured pork, they are able to perform a greater amount of labour with more ease to themselves. As an instance of this opinion, we will quote the reply of a young Yankee backwoodsman to an English settler, upon his being questioned concerning the extent of the work he would be able to execute. "I guess," replied he, "if Mr. ——— will give me plenty of pork and beans, that I shall be able to do as much work for him as any other man he will find." The beans he alluded to are the small white dwarf French beans, which are grown in the fields in those countries, and, after being threshed, are kept in bags in dry situations for household use, a portion of them being boiled almost daily (and they boil beautifully soft and pulpy), and served up to the table with a piece of corn-fed pork, none other means of fattening hogs being equally esteemed in America; and here they are certainly right, for the pork that has been fed upon Indian corn cannot possibly be surpassed in its general good quality.

even middling crops of grass or grain, would require a large outlay of labour and expense at the commencement, and, to keep such lands in any respectable sort of order, a frequent expenditure afterwards; whereas, were such soils converted into plantations and woodlands, the annual cuttings and cullings would in all probability fully cover the expenses of keeping them in proper order.

Autumn is decidedly the best season for planting or sowing some sorts of mast or nuts, for the young plants get a start, which is not the case when sown in the spring, and are consequently the better calculated to withstand the severities of the succeeding winter, should the frost happen to prove severe. With regard to the sowing of acorns, Tusser remarks as follows:—

> "Sow acorns, ye owners that timber do love,
> Sow haw and rye with them the better to prove:
> If cattle or coney may enter to crop,
> Young oak is in danger of losing his top." *

The plan here recommended is by no means a bad one, though now-a-days but seldom resorted to; but a moderately thin crop of either wheat or rye, where the land is entirely free from weeds, to say nothing of the haws, will seldom interfere with the growth of the seedlings so as to materially injure them; and if the reapers are careful, little harm will ensue to the young plants. When this plan is adopted, as soon as the grain is out of the way, a party of trustworthy hands should immediately set about hoeing up the stubble and any weeds which may have crept in, and should carefully stir the whole surface. With regard to raising young pine-trees for planting out or for thinning and permitting to stand for plantations, the seed should be sowed moderately early in the spring, about the middle or latter part of March, and when the seed germinates and the young plants begin to appear above the surface, boys should be employed to scare away the birds, which otherwise would do the plants serious injury by picking off the seed while still attached to the leading shoot, and thus preventing it from becoming straight and perfect. Some sorts of firs or pines are peculiarly well adapted to the forming of plantations where the soil is but cold and barren and the situation bleak and exposed. The Scotch fir and the larch are amongst the kinds best adapted for our English barren wastes; and since their growth is more rapid than most other kinds of forest trees, one of the greatest objections against forming plantations, that is, the long period which necessarily intervenes between the date of planting and the period when the trees become fit for use, applies less forcibly in this case than in most others.

This is commonly the principal month for cider-making, and although it is used by the inhabitants of but some half-dozen counties, yet it seems of sufficient interest to require some notice in a monthly manual like that upon which we are engaged. In an early number we referred to the general condition of the apple-orchards, and we are still of the same opinion, that few if any of the various departments of husbandry (if this may be called one of them) are attended to with so little judgment and care as are most of the orchards in the cider districts; since several of them exhibit but too apparent proofs of the absence of ordinary attention, as well as the existence of an inferior quality of fruit upon a considerable number of the trees of almost every orchard that are still suffered to encumber the land. We are not aware of any attempts having been made to vindicate the indifferent management of the orchards here referred to; but regarding the bad fruit for cider, of which we find more or less in most of the orchards, their occupiers allege that the orchards bear fruit the better where the trees are of numerous varieties. Besides, say they, it is a well ascertained fact, that if we were to plant but two or three sorts of trees, we should find the apple crop more frequently failing altogether than it does at present. This appears to us, however, but a weak and defective argument; for, admitting that there ought to be a due admixture of apples in a large cider orchard, there surely are plenty of really good and valuable varieties of apples without being under the necessity of planting or engrafting a single tree of an inferior kind; and that indifferent apples can be produced in larger quantities than those of a better quality, we much doubt, since, from all that we have witnessed, this by no means appears to be the case, for the tasteless, juiceless, and mawkish-flavoured fruits—decidedly the worst sorts for cider—are by no means the most hardy and unfailing produce of the apple-orchard.

It is rather singular that Tusser, in the whole of his observations upon the management of husbandry affairs, never once refers to cider or cider-making, though he does speak of verjuice. It is true that he never appears to have resided in any of the cider counties; but as he was born in Essex (adjoining Kent, which is a cider county), and was afterwards engaged as an agriculturist in that and some of the neighbouring counties, it certainly is somewhat odd that he nowhere refers to cider as an English beverage. He does, however, extend his observations to orchards and fruit in general; and although in doing so, like many other writers of former times, he appears to have been biassed and prejudiced in the opinion that the moon possessed a peculiar influence over various productions of the soil, yet his observations upon gathering fruit, leaving the moon out of the question, are as sane and sound as usual:—

> "Out fruit go and gather, but not in the dew,
> With crab and with walnut, for fear of a shrew.
> The moon in the wane, gather fruit for to last,
> But winter fruit gather when Michel is past."

Again—

> "Fruit gathered too timely will taste of the wood,
> Will shrink and be bitter, and seldom prove good;
> So fruit that is shaken and beat off a tree,
> With bruising and falling, soon faulty will be."*

We will now proceed to offer a few remarks upon cider-making, which, as far as practicable, are strictly attended to by the most celebrated cider-makers in the west of England. The fruit which is intended for cider ought to be thoroughly ripe at the time it is gathered, for the juice of unripe apples retains something of their harsh and sour taste, in spite of every endeavour to remove it, and is never brought to acquire that racy and mellow flavour which perfect ripeness can alone bestow. The practice which is so often resorted to of sweating the apples in heaps may in some measure impart to them an artificial ripeness; but the palate that is accustomed to good cider will always detect that which is forced from that which is purely natural. There may be circumstances, however, in which the maker of cider may feel justified in departing from so good a rule, for it sometimes happens that high winds commit great ravages in the apple-orchards before many of the apples are near ripe, when, as there would be no sale for them under such circumstances, the only thing the proprietor can do is to bring them into the best condition he can by sweating them in heaps preparatory to converting their juice into cider; or, when the weather is sunny and dry, by exposing them to its influence for several days, they will in a measure become mellowed into premature ripeness. To show the powerful influence which a warm sun has upon perfecting the flavour of most kinds of fruit, we may mention that, in some parts of our North American colonies, as well as in the northern and middle sections of the United States, cider is made from precisely the same sort of apples that it is frequently made from in this country; but owing to the greater power and the less cloudy state of the atmosphere in those countries than in England, the apples and cider too possess a finer and more mellow flavour.

* 'October's Husbandry.

* 'September's Husbandry.'

When the making of cider commences, the whole of the apples in an orchard ought not to be gathered promiscuously; since even amongst the best varieties of cider-apples there are probably three or four weeks' difference in their time of becoming ripe; and nothing can be more easy than to make a selection of trees from which to take the fruit at the same time; for even on the score of inconvenience there can be little to object to in such a plan; if the cider were all to be made in one day, then there might be a reasonable cause for such a proceeding. Some persons have objected to apples remaining to ripen on the trees, alleging that many of them in doing so become quite mealy, and consequently yield less juice than when pulled at an earlier period; but the best answer to such an argument would be, to remind them that apples of such a quality were never intended for cider-apples; for few mealy apples contain much agreeable tartness, and juice and astringency constitute the leading properties of a good cider-apple. Remarkably soft and hard apples never ought to be ground and pressed together, for a portion of the pulp of the soft ones will be found floating in cider made in this way; indeed to such a degree, that it will be nearly impossible to make it fine and transparent.

The more care that is bestowed upon the gathering of the apples, the better is likely to be the quality of the cider; and where hand-gathering is resorted to—though it undoubtedly requires more labour—the extra trouble is commonly well repaid by the superior quality of the cider. Moreover the trees are less injured in this way, than where the apples, and frequently the fruit-bearing branches too, are beaten off the trees with long poles: when, if the apples are not immediately taken to the cider-mill, many of them will decay from the bruises they have received, and probably taint the cider. Dry weather is greatly to be recommended at the time of gathering, in whichever way it is performed; for if apples are gathered wet and piled up in that condition, the object looked for by the process of sweating is less likely to be obtained; while, if on the contrary it is the intention to submit them at once to the cider-press, it should be recollected that water, in all vinous liquors, is a bad ingredient. Though sweating apples in heaps, as regards early and mellow fruit, and the better descriptions of apples generally, cannot be recommended,—it must be acknowledged there are so many late, hard, and trashy sorts in most of the cider counties, that they would, in our seasons in general, hang upon the trees until the frost set in, without becoming sufficiently mellow for grinding in the cider-mill. In order, therefore, to make cider from such apples as these, it probably is best to collect them into heaps of thirty or forty bushels each—the larger the heap, the sooner they become mellowed—where they should remain no longer than their condition seems to require. But they ought not to be laid, as is often the case, upon the wet grass, or in damp situations, but upon some dry boarded floor in the vicinity of the press, or upon clean straw where there is a roof to protect them from the rains and dews.

Of the various modes of treatment the cider is subjected to after it has been made, in the different cider counties, we shall not enter upon any explanation; neither have we space to illustrate the nature, form, and construction of the different presses in use; for cider-making, like most branches of agricultural affairs, notwithstanding all that has been effected in the way of improving the system, and perfecting the implements in general use, is yet very far from being carried out in one common practice founded upon some rational and general principle. It is a little remarkable that beyond the limits of certain counties or districts no cider whatever is made; and as the taste for cider does not seem to be on the increase, it is not probable that the original cider producers are likely to have their prospects, in this matter, interfered with. It has sometimes struck us, however, that if there were here and there cider-presses established in all those districts of country that apples are grown pretty abundantly in, in those seasons that happen to be uncommonly productive,—so much so that the growers are scarcely paid for their trouble of gathering and taking them to the neighbouring market-towns,—the owners of the presses would be able to afford the growers better prices than they often, under peculiar circumstances, are obliged to submit to, and might afterwards manage to make a fair profit upon their cider.

Perry, compared with cider, is made in but small quantities; but as it is generally preferred to cider by persons unaccustomed to either of them as an ordinary beverage, were it equally cheap and procurable, it appears to us that much more of it would be consumed than is the case at present. Besides, it has long since been ascertained that pear-trees will thrive upon soils that apple-trees cannot be raised upon, so that in districts remote from the cider counties there would be no difficulty in cultivating pears in sufficient quantities to be submitted to the press and made into perry.

Having considered it necessary to introduce the subject of making cider, we cannot refrain from adverting to the subject of *brewing;* and although it is not now-a-days so generally practised in the farm-houses as was the case formerly, yet still the more respectable class of farmers, in most parts of the country, at the season of the year when their crops have been gathered in, continue to prepare their brewing-vessels in order to lay in a supply of what has long been familiarly styled "Old October." Before hops and malt became excisable commodities, many of the large farmers were in the habit of making their own malt, as well as of brewing their own beer, so that they were equally independent of the maltster and brewer.

> "House may be so handsome, and skilfulness such,
> To make thy own malt, it shall profit thee much.
> Some drieth with straw, and some drieth with wood.
> Wood asketh more charge, and yet nothing so good.'*

Were there no restrictions upon malt-making, even at the present day, we feel disposed to doubt the general principle of farmers entering upon that or any other of those duties which evidently belong to persons who make them their general business. The same argument would apply to the tanning of leather; for we much doubt that any ultimate saving would be effected by the consumers generally tanning their own. Brewing, however, is altogether a different affair, as no great expense is attached to preparatory measures; and the process is comparatively simple and soon over. Besides, those who brew their own malt-liquor have no opportunity of making it of precisely the strength and quality they may wish; and when the superior sort has been extracted from the malt, the small-beer and grains, both particularly useful among farmers, will more than prove an equivalent for all the trouble.

> "Brew something for thine,
> Else bring up no swine.
> Where brewer is needful, be brewer thyself,
> What filleth the roof, will help furnish the shelf."

Again,—

> "Well brew, worth cost;
> Ill used, half lost.
> One bushel well brewed, outlasteth some twain,
> And saveth both malt and expenses in vain."†

Among what are commonly accounted the secondary objects of good farming, but which are oftentimes of more consequence than many persons appear inclined to believe, is that of keeping the ground free from ant and mole hills; and according to the extent that farms are observed to be infested in this way, a perfect stranger

* Tasser, 'Malting.' † Tusser, 'Brewing.'

to the occupiers of them would be able in most cases to form a tolerably correct estimate of their characters as farmers for good or bad management. Both ants and moles frequently prove great annoyances to the husbandman; and as regards the latter, it may not happen to be always his own fault, should he find his meadows and pastures infested therewith at the season of the year after the crops have been gathered in, and when it is particularly desirable that such vermin should be destroyed. The case where a farmer should be exonerated from all blame, when we witness his ground overrun with mole-hills, can only be where he has employed all due means to rid himself of these predatory little animals; but, happening to be surrounded with neighbours less vigilant than himself, whose lands lie contiguous to and abut upon his own, by their neglecting the destruction of the moles, a portion of the increase will be sure to find their way into meadows and pastures that had previously been free from them; and such an occurrence can scarcely fail to be a subject of real annoyance to an individual who prides himself on the appearance and husbandry-like management of his farm.

In many parts of the country whole parishes or townships agree with some individual, who styles himself a mole-catcher, for the destroying of all the moles within the limits of the district; but the best plan is that where parishes unite in letting the catching of their moles—not from year to year, as is commonly the case—but for a term of seven, ten, or even a greater number of years; for where this is the case, it becomes the interest of the mole-catcher to destroy the entire breed, if he possibly can, at as early a period of the term as possible; and were he to devote more time and labour to effect this object, for one or two seasons at the commencement, than his annual stipend would appear to warrant his doing, in the end he would be a considerable gainer; for during the latter period of the term, having little or nothing to engage his attention in that quarter, he would be at liberty to devote his time to objects elsewhere. But the mole-catcher would not be the only gainer in a case like the one alluded to, for every individual connected with the occupation of the land would be more or less benefited.

The autumn and the spring are the seasons best calculated for the destruction of moles: during the summer they frequently carry on their burrowing and throwing up hills among the crops of grass and grain, and cannot consequently be so conveniently got at; and frost and snow are calculated to interfere with the trapping of them during the severer part of winter. It therefore behoves all persons engaged in the affairs of husbandry to see that the mole-catcher performs his duty at this particular season of the year, or else to look to the destruction of the moles themselves; for notwithstanding it is customary to employ persons who make mole-catching a regular business, in most cases farmers or their assistants would experience but little difficulty in catching them themselves. Since moles do not confine their haunts to the region of luxuriant meadows or cultivated grounds, for they are as generally found infesting wastes and elevated commons, it happens that in those parts of the country where such unclaimed lands abound the farmers find it impossible to keep their lands free from becoming infested by those pests to agriculture. Besides the damage which they do by rooting up and loosening the roots of such grass, corn, and other plants as may happen to grow near their burrows, it frequently happens, when they get among such covered drains as are frequently resorted to in wet soils, that a considerable extent of damage is done by their stopping up the narrow channels left to convey away the water. The banks too of ponds and rivers are sometimes seriously injured by moles working their way through them; and instances are upon record of serious outbreaks of rivers, where a mole-hole was the original channel by which the water made its escape. When moles throw up hills of a considerable size, which they sometimes do, the best plan is to spread the mould lightly over the surrounding surface at the earliest convenient opportunity. Some persons go to the trouble of carting the mould away, and, with other substances, forming it into a compost; but since there is no peculiar fertility in the soil of which a mole-hill is composed, any other, procured at less trouble, would answer equally well: friend Tusser, however, advocates the former plan; for he says:—

> "Make hillocks of mole-hills in field throughout,
> And so to remain till the year go about;
> Make also the like whereas plots be too high,
> All winter a-rotting for compost to lie."*

Diminutive as the common ants are, yet from their unceasing exertions to erect storehouses wherein to lay up provisions for the future, the size of the ant-hills which we sometimes meet with, where their destruction has been neglected from year to year, would greatly astonish persons unacquainted with the fact. Indeed, in many parts of the country, ants are considered greater annoyances to the husbandman than moles; for while with proper care, and a small annual expense, the entire race of the former may frequently be extirpated, upon one farm, or perhaps several adjoining ones, with the exercise of the greatest care, and a continual perseverance, it is found wholly impracticable to destroy the breed of ants in a single field. By a proper degree of attention, however, the farmer may prevent the ant-hills from attaining any great size; for where a hill is observed to be forming, a severe pounding or beating of the earth with a beetle, or any other heavy and blunt implement, will cause the destruction of a large portion of the ants, and so completely disarrange or utterly ruin their storehouses, that those which escape with life will not be apt to commence their works again in the same place. When, however, the ant-hills have been allowed to accumulate until they have attained a large size, and have become nuisances of no ordinary sort in both meadow and pasture lands, the best plan is to attack them in the autumn, which should be commenced by removing the hills completely, either by using a sharp spade or a species of plough invented especially for this purpose: the hills, being afterwards removed a short distance from their old sites, should be placed the bottom upwards, so that the rains would penetrate the workings and drive out the ants; and the succeeding frosts would be sure to destroy large numbers of them. But should it be practicable to have a supply of quick-lime at hand, the best plan is to cast away the ant-hills as they are loosened from their original sites, and the hills and ants and all mixed at once with as much of the lime as should be found sufficient to destroy them root and branch. Not, however, that we wish to insinuate that a compost made in this way would possess any superior qualities as a manure, for even where fertile soils are infested with ants, the hills they construct are mostly composed of particles of sand, these, apparently, being better adapted to the erection of their storehouses and granaries than the finer particles of the soil. Incredible as it may appear to persons wholly unacquainted with matters of this sort, we have seen ground so completely overrun with ant-hills, that but little clear space remained between them, and many of the hills were of an extraordinary size, measuring five or six feet in diameter, and not less than eighteen inches or two feet in height, that is, above the level of the ground between them.

As winter approaches, it ought to be the husbandman's care that not only his fences, which we previously referred to, be put in good order, but that the yards, sheds, and outoffices generally, be in a fit and proper condition for the uses to which they may respectively be applied; for upon the degree of care and attention bestowed upon farm-stock during the winter season, no small portion of the

* 'November's Husbandry.'

general profits of farming depends. In no department of husbandry affairs have greater improvements been introduced than in those connected with the farm-yard and the buildings commonly included in what is called the homestead. The great changes in crops and farm produce generally, that the improved system of tillage has introduced, may in some measure have tended to produce the improvements we allude to; but it strikes us as very extraordinary, upon thoroughly examining into the character of farm-buildings which have been erected more than a century ago, that we find no traces of any attempts, on the part of the planners or builders, to avoid palpable inconvenience, or, more properly perhaps, to make convenience any part of their study. In many cases it seems not to have been thought worth the while of the rustic architect to carry utility of design into departments of so lowly a condition as that of a hovel to shelter pigs or young cattle in, or a nondescript building wherein to stable horses and cows: the comfort of the tenants of these rude side-walls, with still ruder roofs, seems to have been a subject of no weight or consideration. But we now meet with, in nearly all the better cultivated districts of the kingdom, the offices belonging to a farm-yard not only regular and pleasing in outward appearance, but within we find the arrangements everywhere systematic and complete, presenting the best securities for the safe deposit of the various farm products, and, at the same time, the greatest facilities for the various duties that are required from those who have farm-stock to attend to. A proper degree of warmth and ventilation is never lost sight of in the pretent day; while neatness and cleanliness, even as regards hogs and cattle, are considered nearly as indispensable as a daily supply of food. Slovenliness and neglect being no longer tolerated, there is now no plea for the litter and waste once so conspicuous in most farm-yards; and the various kinds of crops, by being kept in more convenient situations, and in better order too, may be removed as they are wanted at the least possible expense of labour; for the architects of the present day are philosophers enough to understand that a saving of labour, to him who has wages to pay, is a saving of money.

The inconvenience and absence of any really useful plan seems equally to have extended to the farm-houses themselves; for when we compare the unshapely and irregular old edifices with those that are erected at the present day, we can scarcely be induced to award much of either taste or foresight to the generations that are gone. One thing, above all others, appears very remarkable, the almost universally low and damp condition of the ground-floors, since in the generality of cases (the floors being clay, stone, or mortar), instead of their being raised a little above the level of the surrounding surface, they were sunk beneath it, a descent of a step or two usually leading to the lobby or passage. Regarding the large open and cold 'hall,' we can readily imagine that this was a custom borrowed from the baronial mansions, since in farm-houses the servants used then to be boarded and lodged with their employers, and with the members of the farmer's family, ate at the same board, and congregated around the same fire: but the chambers bore no proportion to the hall, for they were commonly low and comfortless; and, except in what was denominated the guest-chamber, there was but little furniture, and that of the meanest order. But this apparent want of design, or the fitness of things in application to their several uses, did not stop here, but extended throughout the entire range of husbandry implements and household utensils, even to the most ordinary articles in hourly or daily use.

MONTHLY CALENDAR.—DECEMBER—Twelfth Month.

Day of the Month and Week.	Day of the Year.	Sundays and Remarkable Days.	Sun rises.	Eq. Time. Clock aft. Sun.	Sun sets.	Moon's Age.	Moon rises.	Moon sets.
			h. m.	m. s.	h m.		h. m.	h. m.
1 Tu	336	. . .	7 46	10 36	3 52	7·4	0a24	11a2
2 W	337	. . .	7 48	10 13	3 52	☽	0 36	morn
3 Th	338	. . .	7 49	9 49	3 51	9·4	0 48	0 16
4 F	339	. . .	7 50	9 25	3 51	10·4	1 1	1 33
5 S	340	. . .	7 51	9 0	3 50	11·4	1 16	2 54
6 *Su*	341	2 *Sunday in Advent.*	7 53	8 34	3 50	12·4	1 36	4 20
7 M	342	. . .	7 54	8 8	3 50	13·4	2 3	5 50
8 Tu	343	. . .	7 55	7 42	3 49	14·4	2 43	7 20
9 W	344	. . .	7 56	7 15	3 49	○	3 42	8 41
10 Th	345	Grouse-shooting ends.	7 57	6 48	3 49	16·4	5 0	9 44
11 F	346	. . .	7 58	6 20	3 49	17·4	6 30	10 27
12 S	347	. . .	7 59	5 52	3 49	18·4	8 1	10 56
13 *Su*	348	3 *Sunday in Advent.*	8 0	5 23	3 49	19·4	9 28	11 17
14 M	349	. . .	8 1	4 55	3 49	20·4	10 50	11 33
15 Tu	350	[Mich. T. ends.	8 2	4 26	3 49	☾	morn.	11 47
16 W	351	*Ember Week.* Camb.	8 3	3 56	3 49	22·4	0 9	11 59
17 Th	352	Oxford Mich. T. ends.	8 4	3 27	3 49	23·4	1 25	0a11
18 F	353	. . .	8 4	2 57	3 50	24·4	2 40	0 25
19 S	354	. . .	8 5	2 27	3 50	25·4	3 54	0 42
20 *Su*	355	4 *Sunday in Advent.*	8 6	1 57	3 50	26·4	5 8	1 3
21 M	356	*St. Thomas.* Shortest D.	8 6	1 27	3 51	27·4	6 20	1 32
22 Tu	357	[Wint. Q. begins.	8 7	0 57	3 51	28·4	7 25	2 11
23 W	358	. . .	8 7	0 27	3 52	●	8 20	3 1
24 Th	359	. . .	8 8	bef. 3	3 53	0·6	9 3	4 2
25 F	360	*CHRISTMAS DAY.*	8 8	0 33	3 53	1·6	9 34	5 13
26 S	361	*St. Stephen.*	8 8	1 3	3 54	2·6	9 58	6 24
27 *Su*	362	1 *S. aft. Christ. St. John.*	8 9	1 33	3 55	3·6	10 16	7 37
28 M	363	*Innocents.*	8 9	2 3	3 56	4·6	10 30	8 50
29 Tu	364	. . .	8 9	2 32	3 57	5·6	10 43	10 3
30 W	365	. . .	8 9	3 1	3 57	6·6	10 54	11 16
31 Th	366	. . .	8 9	3 30	3 58	☽	11 6	morn

Meteorological Averages.

Barometer.	Ins.
Mean height	29·693
Highest	30·320
Lowest	29·120
Hygrometer.	°
Mean dew-point	37·6
Highest	53
Lowest	15
Mean dryness	1·7
Mean greatest do. of day	3·3
Greatest dryness	10
Thermometer.	
Mean temperature	39·3
Highest	55
Lowest	17
Radiation.	
Mean great. of Sun	5·4
Greatest power	12·5
Mean cold of terrest.	3·5
Greatest ditto	11
	Ins.
Mean qty. of rain	2·426
Mean of evap.	0·516

Table of the Winds.

	Days.	Dew-P.
N.	1	31°·5
N.E.	2¼	29
E.	3½	27·5
S.E.	4	38
S.	2	45·5
S.W.	8¼	44
W.	6	40
N.W.	4	35

SUNDAY LESSONS.

Dec.		MORNING.		EVENING.	
6	2 S. in Adv.	Isaiah 5.	Acts 7 to v. 30	Isaiah 24.	Heb. 12
13	3 „	Isaiah 25.	Acts 13	„ 26	1 Pet. 1
20	4 „	„ 30.	„ 20	„ 32	2 Pet. 3
25	Christ. Day	„ 9	Luke 2 to v. 15	„ 7, v. 10 to 17	Tit. 3, v. 4 to 9.
27	1 aft. Christ.	Isaiah 37.	Rev. 1	„ 38	Rev. 22

THE MOON'S CHANGES.

First Quart. 2nd day, 7h. 18m. mn.
Full . . . 9th day, 4h. 17m. aft.
Last Quart. 15th day, 9h. 4m. aft.
New . . . 23d day, 9h. 25m. aft.
First Quart. 31st day, 10h. 50m. aft.

Day of Mth.	Length of Day.	Day's decrease	Day break.	Twil. ends.	Sun's Semi-di.
	h. m.	h. m.	h. m.	h. m.	
1	7 46	D. in. 1	5 41	5 56	16′ 15″
6	7 45	8 28	5 47	5 55	16 16
11	7 46	8 37	5 53	5 55	16 16
16	7 50	8 41	5 57	5 55	16 17
21	7 57	8 48	6 0	5 58	16 17
26	8 6	8 49	6 2	6 0	16 17

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HORSE ARMOURY IN THE TOWER.—XVI.

THOMAS WENTWORTH, EARL OF STRAFFORD, 1635; CHARLES I., 1640.

[Charles I.]

THOMAS WENTWORTH, earl of Strafford, the son of Sir William Wentworth of Yorkshire, was born April 13th, 1593. He was educated at Cambridge, and before entering into public life spent upwards of a year on the Continent. On his return he was knighted by James I., and shortly after married Margaret Clifford, the eldest daughter of the Earl of Cumberland. In the following year (1614), he succeeded, by the death of his father, to a baronetcy and an estate of 6000*l.* a year. Shortly after this he was sworn into the commission of the peace, and nominated by Sir John Savile to succeed him as custos rotulorum, or keeper of the archives, for the West Riding of Yorkshire. The resignation of Savile, though apparently voluntarily, proceeded from some violent quarrels with his neighbours, the result of his restless and turbulent disposition; and even Wentworth soon became the object of his decided enmity. Having found means to interest in his favour the Duke of Buckingham, Savile meditated a restoration to his former office. At his instance the Duke wrote to Wentworth, informing him that the king having again taken Sir John Savile into favour, had resolved to employ him in his service; and requesting that he would freely return the office of custos rotulorum to the man who had voluntarily resigned it into his hands.

This Wentworth refused to comply with, alleging that Savile's resignation had not been voluntary, but rendered obligatory by his improper conduct. Buckingham, unwilling to incur unnecessary odium by persevering in a matter of but little importance to himself, made some excuses, and did not press the application; but the Duke was not of a disposition to forget even the slightest opposition to his will, and the animosity Wentworth afterwards experienced from Buckingham may be said to have originated in this circumstance.

Neither was the temper of Wentworth of that mild character which would lead him to forget an injury. He was proud, obstinate, and choleric in the extreme, and the sudden violence of his resentment was apt to transport him beyond all bounds of discretion. Yet these defects were in a great measure atoned for by the manliness and candour with which they were acknowledged, and by his endeavours to overcome them.

In 1621 Wentworth entered parliament as member for the county of York; at a time when an unusual combination of circumstances called forth an unwonted display

of address, intrepidity, and eloquence. Wentworth espoused, with moderation, the cause of the parliament, in opposition to the measures of the court. He would probably have entered into the contest then raging with more vigour, but for some overtures made to him by Buckingham, from which he hoped to benefit himself with the court party.

But the professions of friendship made by the Duke were insincere, and when a new parliament was summoned in 1625, Buckingham took care that Wentworth should be appointed sheriff of the county of York, which office then included a disability to serve in parliament. But alarmed by the accusation preparing against him in parliament, Buckingham did not neglect to employ all his arts to conciliate Wentworth, urging that the appointment of sheriff had been made without his knowledge. Wentworth, however, could not be long deluded by his professions, and he determined to oppose him as much as lay in his power.

On the occasion of the endeavour on the part of the king to raise a loan without the aid of parliament, Wentworth refused to pay the demanded contribution; and having before the privy council persisted in justifying his conduct, he was first thrown into prison, and afterwards, as a mitigated punishment, sent to Dartford in Kent, with a prohibition to go above two miles from the town. This confinement did not last long, for in the calling of a new parliament in 1628, he was released and re-elected for the county of York. In this parliament Wentworth condemned the measures that had been adopted since they last met, and became one of the most strenuous advocates for those measures of the parliament, in opposition to the court, which were the causes of so much dissension in those unhappy times. Possessed of an uncommon influence with the party with whom he sided, he was again assailed by Buckingham with many flattering professions; but it was not until the rank of baron, with the promise of a speedy accession to a higher rank, was offered him, that he deserted his party.

It is impossible to excuse his conduct in this case, and the animosity with which the leaders of that party pursued him to his ruin, for his flagrant defection from them, is almost excusable, especially when we know, as many letters written by him during these times, and since made public, abundantly testify, that all this while he was *playing false*, that he might gain an ascendency which would make his name a terror to Buckingham and the court party, and them to look to him as the cause of their difficulties; a position alike pleasing to his pride and his ambition. Alluding to this change in his actions, Hume, with impartiality and with too great mildness, says of him:—"His fidelity to the king was unshaken; but as he now employed all his counsels to support the prerogative, which he had formerly bent all his powers to diminish, his virtue seems not to have been entirely pure, but to have been susceptible of strong impressions from private interest and ambition."

In 1631 he was appointed lord-deputy of Ireland, whither he departed the following year, being invested with more ample powers than had been granted to any of his predecessors in that office. His government was characterised by great firmness and ability; but a haughtiness in his behaviour irritated some of the most considerable persons in the kingdom, while his continual levies on the people for the support of the army, &c., did not help to make him very popular. In September, 1639, he embarked for England, and in January, 1640, he was raised to the earldom of Strafford, at the same time that he was made a Knight of the Garter, and his title elevated from that of deputy to that of lord-lieutenant of Ireland.

On his return to Ireland, where he remained about a fortnight, he sat in parliament, had four subsidies granted, appointed a council of war, and gave orders to levy eight thousand men, which, together with two thousand foot and one thousand horse, the standing army in Ireland, and five thousand horse to be joined with them, were to be sent into Scotland under his lordship's command, to reduce that country to obedience.

He then embarked for England, although at that time labouring under serious indisposition. On his recovery he was made lieutenant-general of the English forces in the north, but the king having agreed to a truce with the Scotch, his lordship had business of a more serious nature to attend to.

On November 3, 1640, the Long Parliament met, determined to redress what they called abuses, by their own authority, and to reduce the power of the king's prerogative.

In these designs the only dangerous obstacle which they feared to encounter appeared to be the vigour and talents of the Earl of Strafford. On taking his seat in the House of Lords, whither he had repaired at the desire and to the assistance of the king, Pym appeared at the bar, and in the name of the Commons impeached him of high treason, on articles which could only be made to constitute that charge by mixing them together, to form what was called "accumulative treason." After a trial, during which every means were resorted to in order to intimidate the peers and the king, he was found guilty. Charles, having promised Strafford his protection on leaving Ireland, endeavoured to avert his impending fate; but a letter which Strafford, hearing of the king's irresolution and anxiety, had written to his majesty, in which he entreated him, for the sake of public peace, to put an end to his unfortunate however innocent life, and to quiet the tumultuous people by granting the request for which they were so importunate, was taken advantage of by the courtiers who surrounded the king, and who urged that the full consent of Strafford to his own death absolved his majesty from every scruple of conscience. The result is too well known. On May 12, 1641, Strafford, in the forty-ninth year of his age, was led to execution. It has been remarked by one of his biographers, that the day of Strafford's death threw a brighter lustre over his name than his most memorable transactions.

As he passed along to Tower Hill, on which the scaffold was erected, the populace, who eagerly thronged to the spectacle, beheld his noble deportment with admiration. His tall and stately figure, the grave dignified symmetry of his features, corresponded with the general impression of his character; and the mildness which had taken place of the usual severity of his forehead, expressed repentance enlivened by hope, and fortitude tempered by resignation. In his address to the people from the scaffold he declared that, however his actions might have been misrepresented, his intentions had always been upright. He bade a last adieu to his brother and friends who attended him, "And now," said he, "I have nigh done; one stroke will make my wife a widow and my dear children fatherless, deprive my poor servants of an indulgent master, and separate me from an affectionate brother and all my friends. But let God be to you and them all in all."

On going to disrobe and prepare himself for the block, he said, "I thank God that I am nowise afraid of death, nor am daunted with any terrors; but do as cheerfully lay down my head at this time, as ever I did when going to repose." He then stretched out his hands as a signal to the executioner, and at one blow his head was severed from his body.

Charles I. We have already spoken of Charles I., the unfortunate master of this misused servant, and we need not here enter into a long narrative of his actions during the time he reigned, as they must be familiar to all our readers. Few kings have been more distinguished for the talents and virtues which adorn and dignify private

life. He was in an eminent degree temperate and religious, and his mind was cultivated by letters and a taste for the fine arts, which he munificently encouraged. In the relations of son, husband, and father, Charles was a pattern to his subjects.

With regard to his struggle with the parliament, it is impossible not to perceive that he strove to maintain a portion of prerogative that had become totally incompatible with any theory of civil and religious liberty; but it is equally certain that he only sought to retain what his predecessors had possessed, and which power never concedes willingly.

"On the whole," says one of our historians, "the errors of Charles were more than atoned for by his sufferings, and although many may demur to his title of martyr, few will hesitate to regard him as a victim to a crisis which the growing power of the Commons and the unsettled nature of the prerogative rendered sooner or later inevitable."

The armour represented in the cut is curiously wrought and gilt, and was presented to Charles, when Prince of Wales, by the City of London.

FALL OF THE ROSSBERG.

The following description of an Alpine land-slip, the wide devastation it spreads around, and the permanent injury it inflicts upon the unfortunate inhabitants, the effects being felt to even a very considerable distance, is extracted from one of the series of 'Hand-books' published by Mr. Murray, designed for the use of continental travellers, and which are the best of their kind that have yet appeared. The one we now use is the 'Hand-book for Switzerland, Savoy, and Piedmont.'

"Mountains have fallen,
Leaving a gap in the clouds, and with the shock
Rocking their Alpine brethren; filling up
The ripe green valleys with destruction's splinters,
Damming the rivers with a sudden dash,
Which crush'd the waters into mist, and made
Their fountains find another channel—thus,
Thus, in its old age, did Mount Rosenberg."—*Byron.*

On approaching Goldau the traveller soon perceives traces of the dreadful catastrophe which buried the original and much larger village of that name, and inundated the valley for a considerable distance with a deluge of stones and rubbish. The mountain which caused this calamity still remains scarred from top to bottom: nothing grows upon its barren surface, and ages must elapse before the aspect of ruin can be removed.

The Rossberg, or Rufiberg, is a mountain 4958 feet high; the upper part of it consists of a conglomerate or pudding-stone, formed of rounded masses of other rocks cemented together, and called by the Germans Nagelflue, or Nail-head, from the knobs and protuberances which its surface presents. From the nature of the structure of this kind of rock it is very liable to become cracked, and if rain-water or springs penetrate these fissures, they will not fail to dissolve the beds of clay which separate the nagelflue from the strata below it, and cause large portions of it to detach themselves from the mass. The strata of the Rossberg are tilted up from the side of the lake of Zug, and slope down towards Goldau like the roof of a house. The slanting direction of the seams which part the strata is well seen on the road from Arth. If, therefore, the clay which fills these seams be washed out by rains, or reduced to the state of a viscous or slimy mud, it is evident that such portions of the rock as have been detached from the rest by the fissures above alluded to, must slip down, like the masses of snow which fall from the roof of a house as soon as the lower side is thawed, or as a vessel when launched slides down the inclined plane purposely greased to hasten its descent. Within the period of human records, destructive landslips had repeatedly fallen from the Rossberg, and a great part of the piles of earth, rock, and stones, which deform the face of the valley, derive their origin from such catastrophes of ancient date; but the most destructive of all appears to have been the last. The vacant space along the top of the mountain, caused by the descent of a portion of it, calculated to have been a league long, a thousand feet broad, and a hundred feet thick, and a small fragment at its further extremity, which remained when the rest broke off, are also very apparent, and assist in telling the story. The long and wide inclined plane forming the side of the mountain, now ploughed up and scarified as it were, was previously covered with fields, woods, and houses. Some of the buildings are still standing within a few yards of the precipice which marks the line of the fracture.

The catastrophe is thus described in the narrative published at the time by Dr. Zay, of Arth, an eye-witness:—

"The summer of 1806 had been very rainy, and on the 1st and 2nd September it rained incessantly. New crevices were observed in the flank of the mountain, a sort of cracking noise was heard internally, stones started out of the ground, detached fragments of rocks rolled down the mountain; at two o'clock in the afternoon on the 2nd of September, a large rock became loose, and in falling raised a cloud of black dust. Toward the lower part of the mountain, the ground seemed pressed down from above; and when a stick or a spade was driven in, it moved of itself. A man, who had been digging in his garden, ran away from fright at these extraordinary appearances; soon a fissure, larger than all the others, was observed; insensibly it increased; springs of water ceased all at once to flow; the pine-trees of the forest absolutely reeled; birds flew away screaming. A few minutes before five o'clock, the symptoms of some mighty catastrophe became still stronger; the whole surface of the mountain seemed to glide down, but so slowly as to afford time to the inhabitants to go away. An old man, who had often predicted some such disaster, was quietly smoking his pipe, when told by a young man, running by, that the mountain was in the act of falling; he rose and looked out, but came into his house again, saying he had time to fill another pipe. The young man, continuing to fly, was thrown down several times, and escaped with difficulty; looking back, he saw the house carried off all at once.

"Another inhabitant, being alarmed, took two of his children and ran away with them, calling to his wife to follow with the third; but she went in for another, who still remained (Marianne, aged five); just then Francisca Ulrich, their servant, was crossing the room, with this Marianne, whom she held by the hand, and saw her mistress; at that instant, as Francisca afterwards said, 'The house appeared to be torn from its foundation (it was of wood), and spun round and round like a teetotum; I was sometimes on my head, sometimes on my feet, in total darkness, and violently separated from the child.' When the motion stopped, she found herself jammed in on all sides, with her head downwards, much bruised, and in extreme pain. She supposed she was buried alive at a great depth; with much difficulty she disengaged her right hand, and wiped the blood from her eyes. Presently she heard the faint moans of Marianne, and called to her by name; the child answered that she was on her back among stones and bushes, which held her fast, but that her hands were free, and that she saw the light, and even something green. She asked whether people would not soon come to take them out. Francisca answered that it was the day of judgment, and that no one was left to help them, but that they would be released by death, and be happy in heaven. They prayed together. At last Francisca's ear was struck by the sound of a bell, which she knew to be that of Stenenberg: then seven o'clock struck in another village, and she began to hope there were still living beings, and endeavoured to comfort the child. The poor little girl was at first clamorous for

her supper, but her cries soon became fainter, and at last quite died away. Francisca, still with her head downwards, and surrounded with damp earth, experienced a sense of cold in her feet almost insupportable. After prodigious efforts, she succeeded in disengaging her legs, and thinks this saved her life. Many hours had passed in this situation, when she again heard the voice of Marianne, who had been asleep, and now renewed her lamentations. In the mean time, the unfortunate father, who, with much difficulty, had saved himself and two children, wandered about till daylight, when he came among the ruins to look for the rest of his family. He soon discovered his wife, by a foot which appeared above ground: she was dead, with a child in her arms. His cries, and the noise he made in digging, were heard by Marianne, who called out. She was extricated with a broken thigh, and, saying that Francisca was not far off, a farther search led to her release also, but in such a state that her life was despaired of: she was blind for some days, and remained subject to convulsive fits of terror. It appeared that the house, or themselves at least, had been carried down about one thousand five hundred feet from where it stood before.

"In another place, a child two years old was found unhurt, lying on its straw mattress upon the mud, without any vestige of the house from which he had been separated. Such a mass of earth and stones rushed at once into the lake of Lowertz, although five miles distant, that one end of it was filled up, and a prodigious wave passing completely over the island of Schwanau, seventy feet above the usual level of the water, overwhelmed the opposite shore, and, as it returned, swept away into the lake many houses with their inhabitants. The village of Seewen, situated at the farther end, was inundated, and some houses washed away, and the flood carried live fish into the village of Steinen. The chapel of Olten, built of wood, was found half a league from the place it had previously occupied, and many large blocks of stone completely changed their position.

"The most considerable of the villages overwhelmed in the vale of Arth was Goldau, and its name is now affixed to the whole melancholy story and place. I shall relate only one more incident:—A party of eleven travellers from Berne, belonging to the most distinguished families there, arrived at Arth on the 2nd of September, and set off on foot for the Righi a few minutes before the catastrophe. Seven of them had got about two hundred yards a-head—the other four saw them entering the village of Goldau, and one of the latter, Mr. R. Jenner, pointing out to the rest the summit of the Rossberg (full four miles off in a straight line), where some strange commotion seemed taking place, which they themselves (the four behind) were observing with a telescope, and had entered into conversation on the subject with some strangers just come up; when, all at once, a flight of stones, like cannon-balls, traversed the air above their heads; a cloud of dust obscured the valley; a frightful noise was heard. They fled! As soon as the obscurity was so far dissipated as to make objects discernible, they sought their friends, but the village of Goldau had disappeared under a heap of stones and rubbish one hundred feet in height, and the whole valley presented nothing but a perfect chaos! Of the unfortunate survivors, one lost a wife to whom he was just married, one a son, a third the two pupils under his care; all researches to discover their remains were, and have ever since been, fruitless. Nothing is left of Goldau but the bell which hung in its steeple, and which was found about a mile off. With the rocks torrents of mud came down, acting as rollers; but they took a different direction when in the valley, the mud following the slope of the ground towards the lake of Lowertz, while the rocks, preserving a straight course, glanced across the valley towards the Righi. The rocks above, moving much faster than those near the ground, went farther, and ascended even a great way up the Righi: its base is covered with large blocks carried to an incredible height, and by which trees were mowed down, as they might have been by cannon.

"A long track of ruins, like a scarf, hangs from the shoulder of the Rossberg, in hideous barrenness, over the rich dress of shaggy woods and green pastures, and grows wider and wider down to the lake of Lowertz and to the Righi, a distance of four or five miles. Its greatest breadth may be three miles, and the triangular area of ruins is fully equal to that of Paris, taken at the external boulevards, or about double the real extent of the inhabited city. I notice, however, that the portion of the strata at the top of the Rossberg, which slid down into the valley, is certainly less than the chaotic accumulation below; and I have no doubt that a considerable part of it comes from the soil of the valley itself, ploughed up and thrown into ridges like the waves of the sea, and hurled to prodigious distances by the impulse of the descending mass, plunging upon it with a force not very inferior to that of a cannon-ball."*

The effects of this terrible convulsion were the entire destruction of the villages Goldau, Bussingen, and Rothen, and a part of Lowertz; the rich pasturages in the valley and on the slope of the mountain, entirely overwhelmed by it and ruined, were estimated to be worth 150,000*l*. One hundred and eleven houses, and more than two hundred stables and chalets, were buried under the debris of rocks, which of themselves form a mountain several hundred feet high; more than four hundred and fifty human beings perished by this catastrophe, and whole herds of cattle were swept away. Five minutes sufficed to complete the work of destruction. The inhabitants of the neighbouring towns and villages were first roused by loud and grating sounds like thunder: they looked towards the spot from which it came, and beheld the valley shrouded in a cloud of dust—when it had cleared away, they found the face of nature changed. The houses of Goldau were literally crushed beneath the weight of superincumbent masses. Lowertz was overwhelmed by a torrent of mud.

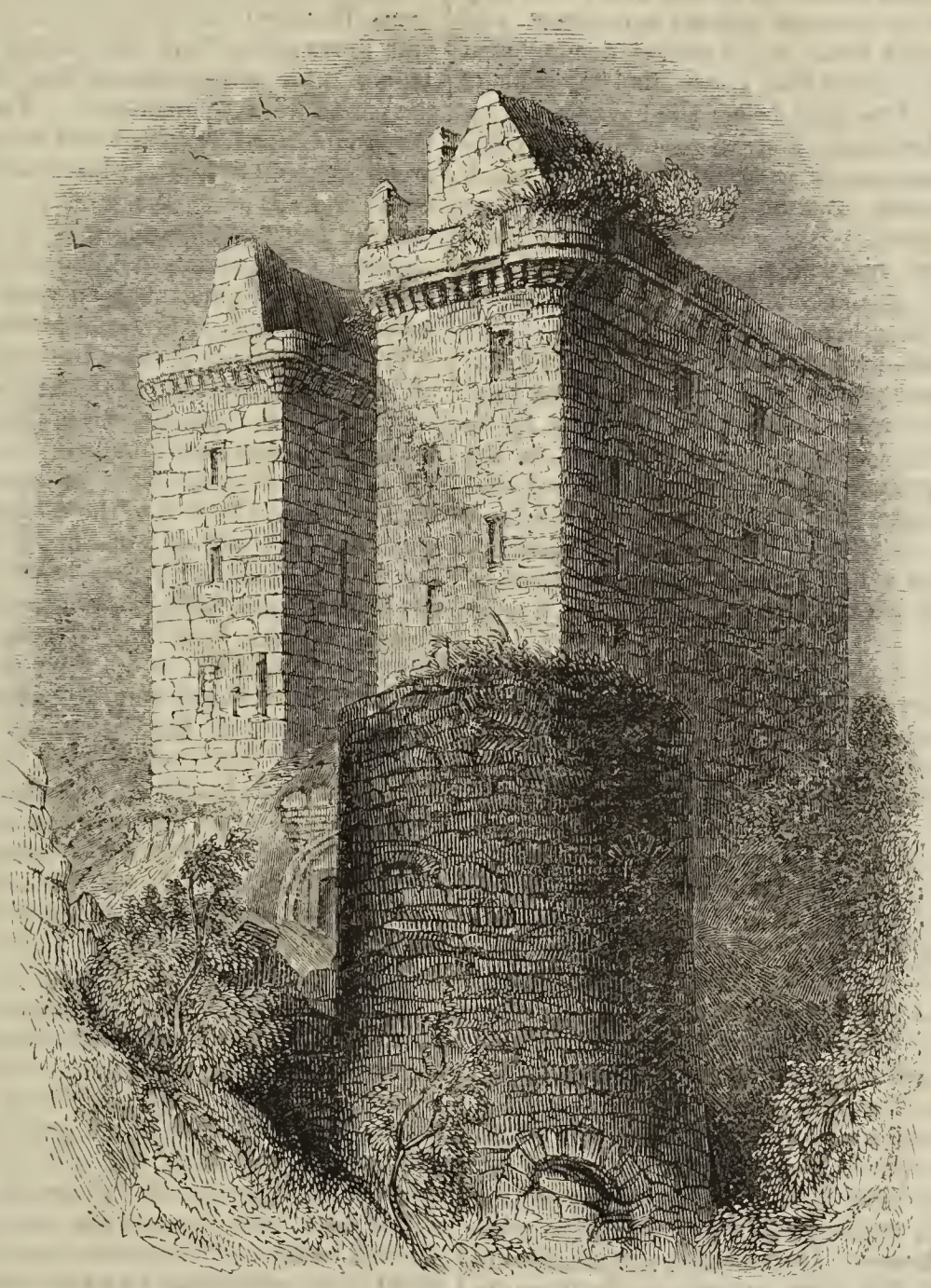
Those who desire a near view of the landslip should ascend the Gnypenstock, whose summit may be reached in three hours from Arth.

History, Biography, and Correspondence.—As history of times is the best ground for discourse of government, so history of lives is the most proper for discourse of business, because it is most conversant in private actions. Nay, there is a ground of discourse for this purpose fitter than them both, which is discourse upon letters, such as are wise and weighty, as many are of Cicero ad Atticum, and others. For letters have a great and more particular representation of business than either chronicles or lives.—*Bacon's Advancement of Learning.*

Economy of Food.—The Royal Agricultural Society of England has offered a prize of ten sovereigns, or a piece of plate of that value, for the best directions to enable labourers to prepare wholesome, nutritious, and palatable food, in the most economical and easy manner. As the object of the society in offering this prize is to procure such instructions for agricultural labourers as may enable them to supply themselves with the greatest quantity of nutriment which the means at their command will produce, and to prepare a warm, comfortable, and nutritious meal for themselves and their families, when they return home from their day's work, the competitors for it are requested to observe—1. That the receipts must be given in such a plain manner as may render them available to a labourer or his wife, who are unaccustomed to cookery. 2. That the receipts must be such as may be used without requiring any apparatus which any agricultural labourer does not usually possess. 3. That they shall not require the use of any ingredients which he may not easily procure, either from his garden, or in agricultural villages. (This condition is not intended to preclude the recommendation of fish as a part of any dish.) 4. The cost of the different dishes must be accurately stated.

* Simond's 'Switzerland.'

BORTHWICK CASTLE, SCOTLAND.



[Present Remains of Borthwick Castle.—From a Sketch.]

The parish of Borthwick, situated in the picturesque district of the Lammermuir hills, about twelves miles south from Edinburgh, and in the shire of the same name, presents various objects of interest to the passing traveller. In the village manse was born, in the year 1721, the eminent historian Robertson, who, it is recorded, was accustomed in his later years to look back with peculiar delight to the scenes among which his boyhood was spent. On an eminence called Cowlsae Hill, which commands one of the richest and most extensive prospects in that part of the country, we find almost at the summit a curious detached mass of rock, that if not placed there by the Druids, seems to have been used for druidical or other important national ceremonies, from the various tokens of burial found near it: lastly, we may observe that the entire district is rich in natural productions. Glimpses of the solitary heron, the most patient and attentive of anglers, may here be obtained; the glowworm, an insect uncommon in Scotland, here quite an object of attraction to the numerous visitors of the valley; the ground under the shade of the more luxuriant woods, and along the banks of the various streams, is covered with a more gorgeous natural carpet than we should conceive possible in these northern latitudes, and in the proper season all the hill sides are richly covered with wild roses, distinguished for their natural beauty of tint and delicacy of perfume. But more than all these, the castle, shown in the engraving at the head of this paper, commands attention by its noble elevation and generally impressive character, and adds a deeper interest to the locality by its historical connections.

The edifice was built by the first Lord Borthwick, who, about the year 1430, obtained from King James I., a special license for the erection, upon a spot called the Mote of Locherwort, of a castle and fortalice, to be surrounded with walls and ditches, defended with gates of brass or iron, and fortified with battlements, turrets, &c. The castle stands on an eminence, surrounded on all sides except the west by water. It is considered to be remarkable for the elegance of its proportions, and for the excellence of its masonry; and as forming on the whole one of the finest examples of that numerous class of Scottish fortifications which consist of a single donjon, or tower, surrounded by embattled walls. It measures without the walls seventy-six feet by sixty-eight feet, and from the adjacent area to the highest part of the roof, about one hundred and ten feet. The walls, which are of hewn stone, are thirteen feet thick at the base, but gradually lessen towards the top to only six feet. The entrance was by an outer stair and drawbridge, both of which are now in ruins. The castle contains, besides the basement story, two large halls, one above the other; and two flights of bed-rooms, which occupy two projections of the castle as seen from the west. The lower hall is a most elegant and beautifully proportioned room. The roof has originally been painted with such devices as occur in the

old illuminations; and in one part the words, "The Temple of Honour," are still found, written in Gothic characters. The room known as Queen Mary's, is very small, unique in its position and general appearance, and is of the kind generally found in old castles, denominated the Lady's Bower. From this bower the unfortunate Mary departed only three days before she gave herself up to the people of Scotland; and those sufferings commenced by her imprisonment in Lochleven Castle, which were only terminated, twenty years later, by her death at Fotheringhay. No part of the castle has been inhabited for upwards of a century; and the neglect which this circumstance has given rise to, is but too evident in its generally ruinous condition. The roof of the upper hall, for instance, is much decayed, and threatens at no distant period great injury, perhaps total destruction to all the lower parts of the building by its fall. Some of the ancient furniture, it is said, is in the possession of the present proprietor of the barony and castle, John Borthwick, Esq. of Crookston, a branch of the noble family to whom they originally belonged. Among these articles are an old oak chair with arms, a low seat, and a high back covered with coronets, a very curious clock, &c.

Foremost in point of time, the chief circumstance recorded in connection with the history of Borthwick Castle, is the following incident recorded by Sir Walter Scott, who published his authority in an extract from the Consistory register of St. Andrew's; it is therefore undoubtedly true; and it is interesting as showing the effect of the operation of the principles of the Reformation only a few years after its introduction into Scotland, in destroying the reverence for and fear of the ancient church. At a period but very little earlier, neither Lord Borthwick nor his vassals would have ventured to treat a sentence of excommunication in the following manner:—

In consequence of a process betwixt Master George Hay de Minzeans and the Lord Borthwick (in 1547), letters of excommunication had passed against the latter, on account of the contumacy of certain witnesses. William Langlands, an apparitor or macer of the see of St. Andrew's, presented these letters to the curate of the church of Borthwick, requiring him to publish the same at the service of high mass. It seems that the inhabitants of the castle were at this time engaged in the favourite sport of enacting the Abbot of Unreason, a species of *high jinks*,* in which a mimic prelate was elected, who, like the Lord of Misrule in England, turned all sort of lawful authority, and particularly the church ritual, into ridicule. This frolicksome person with his retinue, notwithstanding the apparitor's character, entered the church, seized upon the primate's officer without hesitation, and dragging him to the mill-dam on the south side of the castle, compelled him to leap into the water. Not contented with this partial immersion, the Abbot of Unreason pronounced that Mr. William Langlands was not yet sufficiently bathed, and therefore caused his assistants to lay him on his back in the stream, and duck him in the most satisfactory and perfect manner. The unfortunate apparitor was then conducted back to the church, where, for his refreshment after his bath, the letters of excommunication were torn to pieces and steeped in a bowl of wine; the mock abbot probably being of opinion that a tough parchment was but dry eating. Langlands was compelled to eat the letters and swallow the wine, with the comfortable assurance that if any more such letters should arrive during the continuance of this office, they should "a' gang the same gait." It was during the life of this same laird that Mary was a frequent visitor with Bothwell to Borthwick: Crichton Castle, belonging to Bothwell, being in the immediate neighbourhood. The last of these occasions was in June, 1567, a short time after the marriage; which had so incensed the people of Scotland (who generally believed that Bothwell had been a chief actor in the recent murder of Mary's former husband Darnley) that they rose in arms against the pair, and drove them from one fortress to another for safety. Under these circumstances they came to Borthwick at the period we have mentioned. The account of what followed is derived from a letter written by James Beaton, archbishop of Glasgow, to his brother, and which is dated the 17th of June of the same year. We must premise that the prelate had brought Mary intelligence of the increasingly dangerous condition of her affairs, and that he found her "so quiet at Borthwick, that there were none with her passing six or seven persons." He continues:—"Ye shall understand how the said day (11th of June) my lords of Merton, Mar, Hume, Lindsay, &c. with sundry odderis barronis, to the nommer of nine hundredth or a thousand horsemen, arryvit in the morning about Borthwick, in deliberation to comprehend and tak my lord duk, wha was in the said place with the queen's majestic. My lord duk hearing of this enterprise, thinking well he could be in mair securitie in the field than in ane house, passit forth, and red away. Her majestie, in mennis claithes, butit and spurrit, departit that samin nicht of Borthwick to Dunbar, quhairof na man knew saif my lord duk and sum of his servants, wha met her majestie a myll off Borthwick, and conveyed her hieness to Dunbar." Three days after, however, on the eve of the anticipated battle of Carberry Hill, she joined the chiefs of the army arrayed against them; and whilst Bothwell once more fled for safety, she was conducted first to Edinburgh, and next to Lochleven Castle. Her escape from thence, the subsequent battle of Langside, where her subjects completely routed her, her flight into England, her captivity and death, are all well known.

The last event of any importance connected with the history of the castle, occurred during the life of John, the eighth earl. That nobleman, during the civil war, espoused the royal cause; and even when the battle of Dunbar had ruined Charles's prospects in Scotland, and Cromwell's victorious legions were overrunning the country, the garrison of Borthwick from time to time sallied forth, and annoyed the parliamentarians by every possible means. No sooner was Cromwell's attention called to the affair than he wrote and dispatched the following letter:—"For the governor of Borthwick Castle, these:—Sir, I thought fit to send this trumpet to you, to let you know that if you please to walk away with your company and deliver the house to such as I shall send to receive it, you shall have liberty to carry off your armes and goods, and such other necessaries as you have. You harboured such parties in your house as have basely and inhumanely murdered our men; if you necessitate me to bend my cannon against you, you must expect what I doubt not you will not be pleased with. I expect your present answer, and rest your servant, O. Cromwell." The governor, supposed to have been Lord Borthwick, resisted until the artillery had actually opened upon it, and done some damage, when he prudently capitulated, and received honourable terms. The marks of the cannonading are still visible in the eastern wall; and it is said that every attempt at repair has failed, from the difficulty of uniting the modern with the ancient masonry.

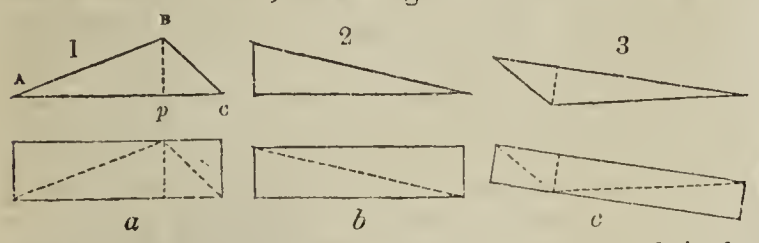
We have little more to add to this account of Borthwick. The old church (a new one has been built near the castle), which is supposed to have been built about the same period as the castle, and is also in ruins, is interesting: in one of its aisles may be seen the monumental statues in a recumbent posture, of the founder of the castle and his lady. The title and honours, &c. of the Borthwick family are now, and for a considerable period have been the subject of dispute: the ninth Lord Borthwick having died without issue or immediate kindred, in the earlier part of the last century.

* Scott's description of this game, in 'Guy Mannering,' will be familiar to most readers.

LAND-SURVEYING.

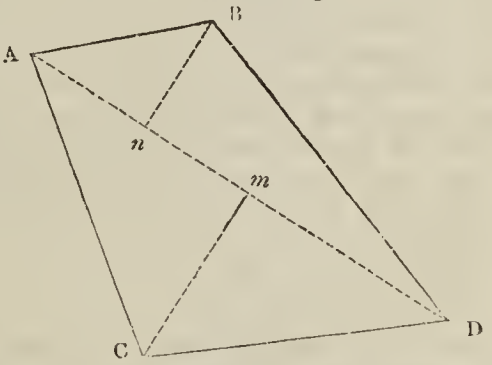
[Concluded from No. 553.]

The annexed three figures, marked 1, 2, and 3, are varieties of the triangle; and by a little careful inspection, it will be seen that each of them is just half as large as the annexed corresponding oblongs, marked *a*, *b*, *c*, which stand beneath them; the longest side in each of the



figures being considered the base, and the breadth is the perpendicular line across each figure, corresponding with, and, in fact, being precisely the same, as the length and breadth of the respective oblongs or long squares. We need not repeat the operation of proving, by figures of arithmetic, that a triangular piece of ground, or a piece of board, of a given length and breadth, is, under all circumstances, exactly half as large as a long square of the same length and breadth; but it is particularly desirable that the reader should bear this in mind, in order that he should not allow himself to be puzzled or alarmed in meeting with such curiously-shaped figures as some triangles may appear to our readers; for by constantly bearing in mind that they are neither more nor less than the halves of that very simple figure the oblong, no doubt or anxiety will remain upon the mind respecting their nature, and the facility with which they may be comprehended, and their contents calculated. It might be asked, but how is the young and unpractised measurer to find the true *breadth* of triangles in general? and this, no doubt, appears to be a difficulty which it seems necessary we should attempt to remove. There is no difficulty in measuring the length, that is as simple an operation as can be performed; but the difficulty seems to be in ascertaining the exact place in the base line from which to begin to measure the breadth or cross line; for, taking the triangle marked 1, for example, in measuring along from A towards C, it would be necessary to ascertain the point *p*; for if that were not done, the breadth of the triangle would be made more than it really is; for a line taken from any other place than *p* (which is directly opposite the upper corner or angle of the triangle) would be a slant or sloping line, and, therefore, longer than the real and true breadth of the figure. In order to accomplish the ascertaining of this point, the measure ought to be provided with a Jacob's or cross staff, which is neither more nor less than a flat piece of board placed upon a staff or pole of four or five feet in length, with two saw-cuts, or narrow grooves, in the upper surface of it, which cross each other at right angles, or at exact squares as it is commonly called. Having previously set up a pole, or something for a mark, if there were no tree, bush, or something else that might answer the purpose, at the upper corner of the triangle, the measurer, in advancing along the base, would have to make use of his cross-staff when he came pretty nearly opposite to the object in the upper corner, and it is possible that he would have to make several trials before he hit upon the exact spot. By sticking the staff firmly into the ground, and then adjusting it so that he could see, by looking backwards and forwards, both the beginning and end of the base or line along which he is measuring, and then applying his eye to the cross-line, he will at once perceive whether a line from where the staff stands strikes on *this* side or *that* side of the object in the corner; and by shifting his staff, backward or forward, as the case may require, he will thus be enabled to find the exact point in the base-line from which the perpendicular, or breadth of the triangle, should be taken. By leaving the cross-staff itself, or any other mark, at the place where the breadth or perpendicular is to be measured from, the measurement of the length or base-line may be continued and completed, before that of the breadth is commenced. It matters not in which direction any line is measured, as its length will be the same; so that the breadth or perpendicular may be measured from the base to the corner, or from the corner to the base, whichever may seem the most convenient.

Considerable space has been bestowed upon the remarks we have been induced to make regarding that very useful and common figure the triangle, as connected with land-measuring in general; for if the reader can but become fully the master of triangles, there is little fear of his failing in attempting to measure fields or pieces of ground generally; since most fields, by cutting off the inequalities of their sides or fences when they happen to be crooked, may be measured either as triangles or as figures of four sides. It has already been observed, that a line drawn diagonally or obliquely across from corner to corner, divides the square or the oblong into two parts, which are triangles of equal size, the one to the other; and we will now further observe, that in every four-sided figure, no matter how unlike a square or oblong it may be, its sides being neither equal nor parallel, a line drawn diagonally across it, that is, from corner to corner, will divide it into two triangles, to each of which the diagonal or dividing-line may be considered as the bottom or the base. A figure of this sort is usually called a trapezium; and in the annexed figure, the dotted line from A to D divides a trapezium into two triangles. The other two dotted lines, the one from *n* to B, and the other from *m* to C, are the breadths or perpendiculars of the two triangles into which the whole field or figure is divided, for the sake of measuring it with the greatest facility; but instead of casting the contents of each triangle separately, since the same base is common to them both,

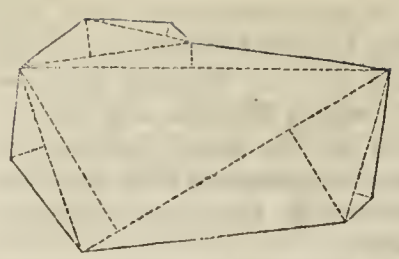


the contents or area of the whole is obtained at a single operation by adding the two breadths or perpendiculars together, and then multiplying the length AC, or base, by that sum, and afterwards dividing by two; or else half the length of the base multiplied by that sum will produce the same result. In the trapezium let AD be 60 rods, *n* B 15 rods, and *m* C 23 rods, the calculations would stand thus,—

15 = *n* B Then 60 = A D
23 = *m* C 38
— —
38 2) 2280
  —
  a. r. p.
160) 1140 (7 0 20 Content.
1120
—
40) 20

Or thus— 15 Then 2) 60
23 —
— 30 half the length of the base.
38 38
  —
  a. r. p.
1140 poles, or 7 0 20 as before.

We will only further add under this head, that if the reader can comprehend what we have already said upon the subject of measuring land, that although he will often meet with fields where the fences are crooked and the shape altogether irregular, these crooks or irregularities may, under all ordinary circumstances, have their contents calculated by measuring them as triangles, trapeziums



oblongs, &c.; and a slight inspection of the annexed field, where the sides are represented more irregular than we generally find them, will, it is presumed, tend to convince the inspector thereof that what we state is perfectly correct. Indeed, as the subjoined figure shows, though some of the sides are crooked, the whole is quite easily divided into triangles, and any divisions thus made will equally apply to field practice.

SCRIPTURAL ILLUSTRATION.

The means afforded of explaining and illustrating the Holy Scriptures by a knowledge of modern Oriental habits and customs is now well known and acknowledged, and we have selected the following as an interesting example of its application, from the '*Illustrated Commentary on the Old and New Testaments*,' now publishing. The passage to be explained is from 1 Samuel, chap. ix., v. 7. 'There is not a present to bring to the man of God.'—"In this passage the points that claim attention are,—that Saul and his servant thought it necessary to offer Samuel a present; that they would have given some victuals if any had been left; but that, having none, they determined to offer him about sevenpence in money. All this would be unintelligible, if merely compared with any usages current among ourselves. We should, by this standard, either regard Saul and his servant as very silly, or else infer that Samuel was very rapacious. This one text alone would, therefore, render manifest the importance of illustrating many of the usages described in Scripture by a reference to analogous usages still prevalent in the East. Such a reference shows that the proceeding of Saul, in offering, and of Samuel, in receiving a present, is perfectly regular and common. The usages concerning presents, which here and elsewhere come under our notice, are among the most diffused customs of the East. It is everywhere the common practice for an inferior to offer a present, of some kind or other, to a superior with whom he desires an interview, or of whom he seeks a favour. Maundrell has well discriminated the character of this usage. After mentioning that, before visiting the Pasha of Tripoli, he sent his present, to procure a propitious reception, he says:—'It is counted uncivil to visit in this country without an offering in hand. All great men expect it as a kind of tribute due to their character and authority, and look upon themselves as affronted, and even defrauded, when this compliment is omitted. Even in familiar visits among inferior people, you shall seldom have them come without bringing a flower, an orange, or some other such token of their respect to the person visited. Being therefore received and offered as a token of respect, the humblest present which the poorest labourer can bring, is never refused by the most exalted personages; on the contrary, they account such presents highly honourable to themselves, and therefore like them to be offered when company is present. To refuse the humblest offering is no less an incivility and insult to the person by whom it is offered, than it is to approach the presence of a superior without any offering

"Neither is there anything extraordinary in Saul's first intention to present Samuel with a piece of bread. Articles of provision are the most usual presents which the rural population offer to their patrons and superiors; as such are the things which they can the most readily furnish from the produce of their field or orchard, or from their stock of poultry, or their goats or sheep. Fruits, flowers, a fowl, a kid, a lamb, suffices to testify his respect, and to introduce him to him whose favour he desires. On the same principle a merchant offers something from that in which he deals, and an artisan, from the products of his skill. Nothing more is expected from him, under the fair operation of this usage, than that which his circumstances or temporary emergencies enable him to furnish. Plutarch relates an anecdote, which is in exact conformity with Oriental ideas. He says, that when Artaxerxes Longimanus was on a journey, he fell in with a peasant, who, being at a distance from his cottage, and, therefore, unprovided with anything which he could offer to his sovereign, in testimony of his homage and respect, ran to the river and filled both his hands with water, which he presented to the king, who received it with most gracious complacency. This handful of water offered to 'the great king,' matches very well with a piece of bread which Saul wished to offer to Samuel. Bread was among the presents of eatables which Jesse sent by the hand of his son David to Saul, when the latter reigned as king (chap. xvi., 20).

"As to money, there is not in all the East any of that peculiar feeling about money which prevails among ourselves. To receive money, is there considered quite as good and graceful as to receive money's worth. Indeed, money is rather preferred; and it is usually offered by those who have no particular profession or pursuit from which a suitable offering might be derived: and a poor person who finds it more convenient to offer sixpence in money, finds it quite as acceptable as the basket of fruit which sixpence would purchase. European travellers in the East, unprovided with what they consider a suitable present to a great man, are often led, by their home ideas, to hesitate about offering money, lest the offer should be regarded as an insult. But they are soon instructed in the difference between the customs of the East and West, by receiving very intelligible hints that money is expected or will be accepted: and they are often astonished to find how small a sum a very great man is satisfied to receive."

Effect of Rational Amusements on the People.—The queen's marriage was honoured, at Manchester, by all the public institutions of the town being thrown open gratuitously to the public. More than seventy thousand persons visited the Zoological Gardens; and yet, we learn from a speech of Mr. S. Greg at the annual meeting of the Macclesfield Useful Knowledge Society, that no wanton mischief was done, nor property destroyed, the whole amount of damage sustained consisting of some of the grass sod being trampled down by the presence of this immense concourse of people; "and as a sequel to all, it is a fact, that after this universal holiday, when the whole population had been turned out to enjoy themselves, the next morning there were *fewer* than even the *ordinary* number of cases of drunkenness brought before the bench of magistrates."

The Egyptian Scarabæus.—In travelling over the desert, another animal that particularly called my attention and excited my admiration, was the scarabæus, or sacred beetle; these were running about in all directions in the warm sunshine, engaged in rolling their balls over the desert with such industry, and in so curious a manner, that I cannot refrain, although on the path to the pyramids, from stopping to notice the little animal so famed in Egyptian story, and that formed so conspicuous a part in the symbolic language and the mythology of this antient people. These little creatures, which are possessed of amazing strength and perseverance, form balls of clay and camel's dung, which they mix up into a kind of mortar, very like that used by swallows to construct their nests; in these they deposit their eggs, and thus it forms a crust or shell to the larvæ within; they then roll these balls when sufficiently dried, over the sand in a truly remarkable manner. The male is provided with two projections in the form of horns on the head, and uses them as a lever to raise and push the ball forward from behind; while the female, mounting before, keeps it revolving onwards by drawing down with her fore feet. Sometimes three or four will get about one ball, either for the sake of work or to get it over any impediment. Others, again, propel them with their hind legs, and will sometimes assume the most grotesque attitudes, literally standing on their heads, and pushing at them with their hind feet. So far as I am able to judge, they keep rolling their balls about over the sand for the whole day, and do not merely place them in holes, like other coleopterous insects. I have watched them at evening, and as soon as the sun had set they invariably deserted their charge and returned to their holes; and what is more remarkable, if the day became suddenly cloudy, off they waddled, and left the ball till a gleam of returning sunshine again called them to work with renewed vigour. It appears to me, from the manner they rolled these balls, they intended that the sun should act equally on all sides of them, and thus secure the heat in the process of incubation. It may, however, be but for the purpose of drying the surface.—*Wild's Travels in Egypt.*

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THE GREAT HALL OF PADUA.

[The Palace of Justice, Herb-market, &c., Padua.]

ONE of the chief curiosities of Padua is the hall or saloon contained in the Palace of Justice (the building seen on the right of the above engraving), and which, for size, has no rival in any part of Europe. What are its exact dimensions we cannot say, for the accounts furnished by different writers vary; but we shall not be far from the truth in stating that the hall is about three hundred feet long, one hundred feet broad, and one hundred feet high. The palace stands on one side of the open space called sometimes Place Salone, from the hall; sometimes Piazza del' Erbe, from the herb-market which is held here. The building was commenced in 1132 (on the site anciently occupied by the Senate House), by driving a great number of large piles into the ground, the interstices of which were filled up with masonry. The foundation being thus formed, the work was allowed to remain in that state until 1209, in order, according to some writers, that it might settle, and become thoroughly firm and compact, a statement that seems to prove that the people of Padua cared very little about the completion of their great hall, or that their patience was most exemplary. Whatever the cause of the delay, the edifice was again proceeded with in the year last mentioned, and completed in 1219. Whether a flat roof then existed, which, not being liked, was afterwards removed; or whether the architect failed to cover the immense space with a safe and durable erection, having only the walls for its support, we do not find anywhere mentioned; but some such cause, we presume, must have led to the building of a second and arched roof in 1306, which was done from the designs of Father John, a monk of no mean architectural acquirements, as the success of the new work proved. After this the walls and ceiling were adorned with a profusion of fresco paintings by Giotto and his scholars, which, in the last century, were retouched by Zannoni. The excellence of the masonry of the building has been put to some severe tests, by the shocks of earthquakes, for instance, which have been felt at Padua, and all of which it has borne without the slightest damage.

The effect produced by a first sight of the interior is very impressive; its vastness at once fixes and absorbs the mind: and there is nothing to break or even to lessen this effect; no galleries, pillars, or erections of any magnitude projecting from the walls; from one end to the other, the eye roams over an uninterrupted space. The hall contains several objects of interest. Against the wall at one end, near the Gothic chair in which sits the president of the court during the administration of justice, is a monument with an ancient bust, to the memory of the great historian Livy, who was born and died in Padua. An inscription on the base concludes with a sentiment expressive of the veneration of the Paduans for their illustrious countryman; it is to the effect that had their means been adequate to their zeal, the marble statue should have been a golden one. Of the fresco paintings, those on the ceiling are entirely lost, owing, says Mrs. Starke, in her work for travellers on the Continent, to the roof having been blown off. The date or cause of this misfortune she does not mention. We may judge how numerous these works of art must have been in the whole, by counting the number contained in the upper most row, which amounts to three hundred and nineteen. There are in the hall various other monuments to eminent natives of the city, including one to Belzoni. Two Egyptian statues of granite, presented by the traveller to his countrymen, are also placed here. Lastly, the hall con-

tains the stone—the "Lapis Vituperii" noticed by Addison, in 1700, at the Hôtel de Ville, and which has since been transferred to its present situation. On this stone debtors were obliged to sit three different times, in the full view of the public, half naked, and swear that they were not worth a certain trifling (specified) sum. After the conclusion of the ceremonies, the debtor was entirely freed from his debts. During the middle ages, most of the principal towns of Italy possessed stones of this kind. At Sienna the form of speech prescribed by the law to be uttered by the chief actor in the ecremony, whilst seated upon the stone, was as follows:—"I have consumed or dissipated all I had; I pay my creditors in the manner that you see."

The hall has been used as a bazaar, as well as for its more legitimate purpose—the transaction of public business, and more particularly for that part of it which concerns the administration of justice. But for some years prior to 1836, it had become so dilapidated from want of timely reparation, as to be quite useless. It was then about to undergo a complete repair, and be again applied to the objects for which it was built.

DOMESTIC CHEMISTRY.—No. XII.

A QUARTERN LOAF.

Nutritious grains, from which bread may be made, bear a considerable resemblance one to another, and all are occasionally selected for this purpose; but wheat possesses the most valuable properties. It is for this reason that the term wheaten is applied to the better kinds of bread, and commands for them a higher price. As the production of a loaf of bread is, in some respects, the most useful of the useful arts, we will briefly describe the processes as usually conducted.

The methods by which the farmer cultivates his cornfield, gathers in the harvest when ripe, and separates the grain from the stalk, we may pass over, as having been recently treated in our Agricultural Supplements. We will suppose the grains of wheat about to be converted into flour.

When wheat is brought to the miller, it is generally too moist for grinding, as, instead of becoming a powder, it would simply be crushed, and would thus clog the millstones. The wheat is therefore spread over a floor constructed of tiles full of small holes. A fire is kindled below the tiles, and the heated air ascending through the holes is admitted to the wheat, which is spread in a layer three or four inches deep. The wheat is subjected to the action of this heated air for about three hours and a half, during which time it is frequently turned over and stirred up. The action of the heat removes the moisture from the grains; and when steam ceases to issue from them, they are removed to a loft, where they are left to cool, and to acquire a certain degree of mellowness, without which the resulting flour would be of inferior quality.

The wheat is now to be cleansed. This is effected by means of a wire cylinder called a *separator*, the wires of which are bent into the form of hoops, and are placed so close that when the grain is introduced and the separator whirled round, none but the small ill-conditioned grains and particles of dirt and sand fall through. The small grain is sold to the distiller, for the purpose of making spirit; and the larger grain which remains in the cylinder is reserved for the making of bread.

The grain is next placed in another screen, consisting of a cylinder of sheet-iron punched full of holes from the outside, whereby a sharp burr points inwards from each hole. The corn is agitated in this cylinder for the purpose of removing the rough end of the grain, which is a brownish soft kind of hair. The grain is next put into an oblong box having a wire-gauze bottom. This box is shaken rapidly to and fro; and at the same time certain fans or vanes, which revolve round an axis placed across the box, excite a current of air through the grain, which blows off the adherent dust and bran.

The grain is now carried to the mill, which, properly speaking, consists of two large stones placed one on another, and moving in contrary directions round a central axis. The corn is made to pass through a hopper or funnel into a hollow space between the stones, occasioned by the contiguous surfaces of the stones being concave. The stones being set in motion, the corn becomes broken up into powder, and is whirled out from between them in the form of meal. As this meal is a mixture of flour and bran, the latter consisting of the husks of the grain, it is necessary to separate them; and for this purpose the meal is placed in a wire cylinder, down the middle of which, and occupying its whole length, is a brush, consisting of a rod from which branch out hairs which touch the wires of the cylinder. The brush being made to rotate, all the flour of the meal is forced through the interstices of the cylinder; the bran, as well as portions of grain not reduced to flour, being retained. The contents of the cylinder are again ground between the mill-stones, by which an inferior kind of flour is produced: this is again passed through the cylinder, and the residue again ground, by which a still inferior flour is afforded.

By these processes are obtained three kinds of flour, technically called *firsts*, *seconds*, and *thirds;* and bread varies in its quality according as it is made of one or other of these kinds. French and cottage bread, best and seconds wheaten bread, and brown bread, differ chiefly in the quality of the wheat flour employed in them. Wheaten flour, in its purest state, consists principally of two proximate substances, *starch* or *farina* and *gluten*, the former occupying about two-thirds the weight of the whole. The nature of starch has already occupied our attention; and the existence of gluten in flour may be shown in the following manner. If a little flour be formed into a stiff paste with water, and worked in the hand under cold water frequently renewed, there results a tasteless, tough, elastic, grey substance, capable of stretching and collapsing like India-rubber. This substance is principally *gluten*, and is the ingredient in flour which confers on paste its adhesive quality; it is also the most nutritive portion of flour.

Before we trace the formation of flour into bread, we must briefly notice the difference between *fermented* and *unfermented* bread. The former is that which, previous to the operation of baking, undergoes a process of partial fermentation, by which the properties of the flour are somewhat altered, and the bread is made light and porous. The latter, of which *biscuit* is a familiar example, is made of dough which has not undergone the process of fermentation. If a mass of flour and water be let to stand for some time, a commotion takes place in it—carbonic acid is formed, and tries to escape, and in the act of so doing gives a honeycomb or porous texture to the substance: this process is fermentation. As, however, this fermentation goes on too slowly and too unequally for the purposes of the baker, it is hastened in one of two ways—by the application either of *leaven* or of *yest*. Leaven consists of a portion of a previous batch of dough which has been laid aside and allowed to partially ferment; and when mixed with new dough, it quickens and improves the fermentation. Leaven is also made artificially in two or three different modes. In some places, eight ounces of flour are mixed with a quart of warm water; and for two or three successive days, while the mass is fermenting, more flour and water are added, by which enough leaven is produced to ferment a large batch of dough. In some parts of Germany, wheat-bran and hops are boiled in water, and then left to ferment; when this occurs, more bran is thrown in, until the whole becomes a thick mass, which is then rolled up into balls, and preserved as leaven or ferment.

But English "quartern loaves" are most frequently

fermented with *yest*, a kind of froth which rises to the top of a liquor in the process of brewing, and which is productive of nearly the same effect as leaven.

The flour and yest then being the principal ingredients, the making of bread proceeds as follows:—A small quantity of yest is mixed with hot water, so that when dissolved it may have the temperature of blood-heat. The salt (of which about two pounds are generally used to a hundredweight of flour) is now added, and the liquor is thrown into a wooden trough. About one-third of the intended quantity of flour is added to the liquor, and is worked about with the hands, to free it from lumps. The surface of the mixture (which is now called *sponge*) is then pressed flat; a little dry flour is sprinkled over it, and the whole is covered up closely for several hours. During this time, fermentation goes on, and the mass of sponge greatly increases in bulk, in consequence of the formation of myriads of minute air-bubbles within it. The sponge is then mixed with a weak solution of salt, slightly warmed in cold weather. The rest of the flour is added, and the whole is worked up into a stiff uniform mass of dough. This kneading is effected in a very uncouth manner by the elbows and fists of the baker; and it is surprising that in an age when machinery is applied to so many purposes, this primitive mode of kneading dough should be still retained. In many parts of the Continent, and in some cases in England, machines have been employed for this purpose. In one of these machines, the dough is put into a square trough in which a cylinder revolves; and as the dough is carried round by the cylinder, it is pressed through a small aperture left between the cylinder and the trough, and becomes by that means perfectly mixed up into a homogeneous mass. In another machine, the dry flour is put into a hollow revolving cylinder, and water is introduced through perforations in the axis on which it revolves: the rotation of the cylinder then mixes the flour and water; and the mass, in each revolution, has to pass through a narrow aperture, and thus becomes kneaded.

When the dough is made, it is allowed to rest covered up for about an hour, during which time it swells, and, when sufficiently spongy, is said to be proof. It is then weighed into separate parcels, according to the intended size of the loaves; and these parcels, when sprinkled with flour, are ready for the oven.

A baker's oven is generally an arched vault floored with smooth fire-tiles, and is generally heated by means of a furnace placed at the side, the flue of which traverses the oven, and heats every part. The batch of bread is not put into the oven until the coals in the furnace burn with but little smoke. The old form of oven was arranged on the plan of kindling a fire *in* the oven itself, until it was intensely heated; the fuel was then withdrawn, and the floor cleared from the ashes and dust before the loaves were put in; but it was found that a great amount of heat escaped while the oven was being cleared and cleaned, and thus much fuel was wasted.

Two hours is the time generally allowed for the baking of bread in the usual ovens. The evaporation from the dough carries off about one-tenth of its whole weight during the process of baking, and a further portion of the weight is lost after the bread is removed from the oven. The different appearances which the sides of loaves present are owing to the positions in which they are placed in the oven, whether in contact with the heated tiles, exposed to the heated air, or in contact with one another.

In making loaves of an inferior quality, *potatoes* are very frequently used; and if the quantity be small, the bread is said to be improved thereby; but when added in large quantity for fraudulent purposes, which is sometimes the case, the bread is deteriorated. The existence of too large a quantity of potatoes in bread may often be indicated by the bread cracking and crumbling, by its soon turning sour, by adhering to the knife when cut, and by leaving a depression when pressed by the finger. The erroneous impression that *white* bread must necessarily be better than that of a darker tint, and therefore worth a higher price, frequently offers an inducement to the baker to add bleaching ingredients to his bread, in order to produce this effect; for no flour except the very finest will produce white bread. In this instance, the taste of the purchasers is partly to blame for the occasional admixture of bleaching substances in the bread. Alum, ground bones, or whiting, are among the ingredients occasionally employed for this purpose; and the means whereby the employment of them may be detected are these:—If bread contain whiting or chalk, and if diluted sulphuric acid be poured on it, there will be an effervescence; but there will be no deposit when pearlash is added to the filtered solution. If ground bones be contained in the bread, and diluted muriatic acid be poured on it, effervescence will ensue; and if it be then filtered and pearlash added, a white heavy deposit will be precipitated. If an excess of alum be used (a very small quantity improves the bread), pour boiling water on the bread; let it cool, and then press out the moisture; boil it away to one-third; when cold, filter it through blotting-paper, and add a little muriate of lime to the filtered liquor: if a muddiness now appear, an excess of alum may be suspected. For a similar end, persons sometimes use an excess of salt in their bread, as, by absorbing a great deal of water, it increases the weight of the loaves: when this is the case, the grain of the bread is very rough; and two loaves, on being parted, generally part uneven, one taking away a portion from the other. Generally speaking, however, we believe that London bread is tolerably free from adulteration.

French bread, cottage bread, French and English rolls, &c. are formed in a more porous and lighter manner than the larger loaves; and all, except the last mentioned, are made of the finest and whitest flour. Butter and milk are occasionally added to the other ingredients in fancy bread.

Changes in Literature.—At the renewal of letters in Europe, the taste was not to compose new books, but to comment on the old ones. It was not to be expected that new books should be written, when there were so many of the ancients, either not known or not understood. It was not reasonable to attempt new conquests, while they had such an extensive region lying waste for want of cultivation. At that period, criticism and erudition were the reigning studies of the times; and he who had only an inventive genius, might have languished in hopeless obscurity. When the writers of antiquity were sufficiently explained and known, the learned set about imitating them: hence proceeded the number of Latin orators, poets, and historians in the reigns of Clement VII. and Alexander VI. This passion for antiquity lasted for many years, to the utter exclusion of every other pursuit, till some began to find that those works which were imitated from nature were more like the writings of antiquity than even those written in express imitation. It was then modern language began to be cultivated with assiduity, and our poets and orators poured forth their wonders upon the world.—*Goldsmith's Bee.*

Anecdote of Sir Matthew Hale.—A nobleman called to explain a suit in which he was interested, and which was shortly to be tried, in order, as was alleged, to its being better understood when actually heard in court. The chief baron interrupted him, saying that he did not deal fairly to come to his chamber about such affairs; for he never received any information of causes but in open court, where both parties were to be heard alike. Nor would he suffer the noble duke to proceed. His grace retired dissatisfied, and complained of it to the king, as a rudeness not to be endured. But his majesty bid him content himself that he was no worse used; adding, that he verily believed he would have treated himself no better had he gone to solicit him in any of his own causes.—*Williams's Memoirs of Sir M Hale.*

THE CULTIVATION OF COFFEE IN BRAZIL, &c.

[Coffee-Plantation in Brazil.—From an engraving in the 'Travels' of Rugendas.]

THE botanical description of coffee, the history of its growth and introduction into Europe as an article of diet, and the general method of cultivating the plant, have been already treated of in an early number of this work.* We now propose to give a few notices of its cultivation in Brazil, and generally throughout South America—a subject of considerable importance—for whilst at present Brazil exports more coffee than any other place in the world, the extensive territories of Mexico, and of the other numerous independent states of that vast continent, will doubtless, before long, swell its product to an incalculable amount.

Although the coffee-plant is indigenous in Brazil (Southey specifies its discovery in the province of Bahia), it was not until the breaking out of the revolution in St. Domingo about fifty years ago, and the consequent rise of prices in Europe which that circumstance occasioned, that any attention was paid to its culture. Some of the planters, driven away by the proscription, which included all the white persons then resident in the country, emigrated to Brazil; one among these, a gentleman of the name of Lesesne, settled in the neighbourhood of Rio de Janeiro, and, at once introducing the best methods, was successful in producing berries of superior flavour. This naturally led to a demand for them at profitable prices; numerous competitors entered the field; and at this day the province of Rio Janeiro is distinguished above every other, alike for the quantity and excellence of the coffee it produces. The growth of this trade is truly remarkable. As we have seen, fifty years ago coffee was neither grown nor exported from any part of South America, yet Brazil about four years ago was exporting at the rate of seventy-two millions of pounds annually (the entire amount of produce is now estimated at one hundred and thirty-four millions), and in the whole, the continent exports not less probably than a hundred millions. It may be useful to compare the amount of this product with the product from the other countries from which the coffee used in Europe is chiefly received. From Cuba about sixty-four millions are exported; from Hayti, forty millions; Java, thirty-two millions; British West Indies, twenty-five millions; French West Indies, four millions, &c.; and from Mocha, one million: the smallness of this last return, we may observe by the way, shows how little of the coffee sold under this name can be genuine. The Brazilian coffee is shipped for all parts of Europe, but chiefly to Antwerp, Hamburg, and Trieste, and also to the United States, which alone receive one-third of the whole. In explanation of the allusion we have before made to the probable future product from Mexico, &c., we may observe, that it is only of very late years that much attention has been paid to the subject; already, however, the number of plantations is considerable, and steadily increases. The soil of Mexico is admirably adapted for the growth of coffee, and the capital required to commence a coffee-plantation is comparatively small. This circumstance it is which gives the coffee cultivator an advantage over the sugar-grower in all those (commercially speaking) new states. A plantation containing two hundred thousand coffee plants does not permanently require more than twenty men; that is to say, ten to weed and ten to water. In addition to these, however, fifty or sixty men are required about three months in the year to collect the crop, and clear and prune the trees. The result is, that Mexico, which in the early part of the present century exported no coffee, in 1830 exported it to the value of twenty thousand dollars.

With regard to the modes of cultivation in South America, "I observed," says Humboldt, speaking of the province of Caraccas in the state of Venezuela, "that in the coffee-plantations the nurseries are formed not so much by collecting together those young plants which accidentally rise under the trees that have yielded a crop, as by exposing the seeds of coffee to germination during five days in heaps between plantain-leaves. These seeds are taken out of the pulp, but yet retaining a part of it adhering to them. When this seed has germinated, it is

* Vol. i., No. 6.

sown, and produces plants that can bear the ardour of the sun better than those that spring up in the shade of the coffee-plantations."* In Mexico, and perhaps in other parts, where the heat is very great, the young plants are protected from the sun for two entire years; for which purpose, a large piece of ground, called the Semillero, is covered in, and thickly planted with young shoots; the third year they are transplanted into the open field, and in the fourth attain their full vigour. The coffee-trees are generally planted at the rate of one in about every two square yards. The trees flower the second year, and, generally speaking, produce abundantly the third year. In Brazil the berries are gathered twice in the year, namely, in the months of February and August; the best and the greatest quantities are sent to market between July and December. The berries are first of a dark green, which becomes red before pulling, and at the same time abound with a whitish milky-looking pulp between the cuticle and the seed; the foliage is dark and shining, and the bushes about nine or ten feet high. As the crop is gathered (the process illustrated in the engraving at the head of this article), the berries are spread out to dry till the pulp hardens; they are then thrown into a mill, where the husk is separated from the seeds; and, lastly, the seeds, now ready for exportation, are packed in long baskets, each containing five arrobas, or one hundred and sixty pounds. These baskets are purchased from the planters by an intermediate class of traders, who convey them in considerable numbers by droves of mules to Rio, or the other nearest port, and there sell them to the merchants. There is a circumstance connected with this transaction, which shows the honesty of the Brazilians in too honourable a light to be passed without mention. We have said that these baskets contain, or ought to contain, a certain specific quantity, and so satisfied are the parties concerned that this is always the case, that neither the merchant in purchasing, nor the custom-house officers in imposing the export duty, re-weigh them. The amount of produce from the coffee-plants varies very greatly: in Brazil the average is about from one pound and a half to two pounds, and this is superior to the mean produce of the West Indies; but in Mexico the average crops on good lands amount to nearly two pounds and a half. In individual cases, the produce is enormously increased: trees are often found bearing from sixteen to twenty pounds of coffee; and in one instance, mentioned by Mr. Ward, in his work on Mexico, the tree bore twenty-eight pounds. But rains at the time of flowering, want of water for artificial irrigation, and a parasitic plant (a new species of loranthus), which clings to the branches, are very injurious to coffee-trees, and tend much to lessen their produce. We may conclude by observing that Humboldt expresses his surprise that no attempt has been made to extract a spirituous liquor from the berries, considering the large proportion of organic matter they contain. He says berries merely heaped together produce a vinous fermentation, and emit a pleasant alcoholic smell.

ASPHALTUM, OR BITUMEN.—No. I.

THE ASPHALTUM LAKES OF PALESTINE AND TRINIDAD.

There are several inflammable substances which, under the various names of asphaltum, bitumen, naphtha, maltha, petroleum, tar, pitch, &c., bear some degree of resemblance to each other, but the distinguishing features of which are not well understood by general readers. It will be desirable to explain in what they differ, before entering on the object of the present paper. *Tar* is a thick, black, unctuous substance, chiefly obtained from the pine and similar trees, by burning them in a close smothering heat. This process is performed to a great extent in the woody countries of northern Europe, in the manner described in 'Penny Magazine,' No. 247. *Pitch* is a residue which is obtained by boiling tar to dryness, and is therefore, like tar, of vegetable origin. *Bitumen* is a general name for several inflammable bodies, all of mineral origin; among which is *Compact Bitumen*, or *Asphaltum*, a black, solid, brittle substance, found in Palestine, Trinidad, and other places. *Elastic Bitumen*, or *Mineral Caoutchouc*, is found in Derbyshire; it possesses a certain degree of elasticity, and will erase the marks of a crayon or black-lead pencil, from which circumstance it has obtained the latter of its two names. *Petroleum* is a thick, viscid, dark-coloured, and strongly odorous substance, somewhat resembling tar; it sometimes oozes from rocks in the neighbourhood of beds of coal; and is also found in wells—a striking instance of which is the petroleum well at Zante ('Pen. Mag.,' No. 20). *Maltha*, or *Sea-Wax*, is a solid whitish substance, not much unlike tallow, found on the surface of Lake Baikal in Siberia, and in some other places. Lastly, *Naphtha* is a fine, white, thin, fragrant, colourless oil, which issues out of the clayey soils of Persia and Medea. Now all these substances possess a great degree of inflammability, and are thus frequently confounded one with another; but the property which we are about to consider, and which belongs only to part of the group, is that of hardening into a very compact and durable substance, when treated in a particular manner. The compact bitumen, or asphaltum, is the principal one possessing this character; but in late years the term *Asphaltum*, or *Asphalte* (the latter of which appears to be the French name), has been frequently applied, not only to the inflammable substance itself, but to the rocky masses in which it is often found. These explanations will fitly preface a brief inquiry into the manner in which asphalte is found combined with other substances on the surface of the earth, and of the mode of usefully employing it in the arts.

Of all the asphaltic regions known, none has acquired such prominent importance as that which is situated in Palestine, and known by the various names of the East Sea, the Salt Sea, the Sea of the Plain, Lake Asphaltites, Dead Sea, &c. This is supposed to be the site of the awful calamity mentioned in the 17th chapter of Genesis: —"Then the Lord rained upon Sodom and Gomorrah brimstone and fire, from the Lord out of heaven: and he overthrew those cities, and all the plain, and all the inhabitants of the cities, and that which grew upon the ground." It is natural that an intense and absorbing degree of interest should be excited by this passage in the sacred writings; and consequently travellers of all ages and nations have been desirous of visiting this spot and making observations on its present appearance. It has happened, however, that the situation of this sea in a country which has long been Mohammedan, and the hostility of rival pashas, have prevented the curiosity of many travellers from being gratified.

The chief features of the lake, as at present existing, are as follows:—It is situated in the southern part of Palestine, and is of an oblong form, being, according to Josephus, seventy-two miles long by eighteen broad, although some modern writers assign for it much smaller dimensions. The water is intensely salt, and the soil around, as well as the air hovering above, is strongly impregnated with saline particles; from these circumstances most animals shun the spot, and thus give it an inexpressively dreary appearance, which, indeed, has acquired for it the name of the "Dead Sea." More modern travellers, however, differ from these statements: the Rev. J. D. Paxon says, "Instead of that dark, gloomy, and turbid spread of water that from my childhood I had imagined, it struck me as a very pleasant lake. It reminded me of the beautiful lake of Nice." But the feature for which we here notice the lake is the quantity of *Asphaltum* floating on the surface. Moses, in the 14th chapter of Genesis, had said that the vale of

* 'Personal Narrative,' translated by Helen Williams, vol. iv., p. 68.

Siddim was full of *slime-pits;* and it has been supposed that the asphaltum arises from those slime-pits, now submerged beneath the waters of the lake. The asphaltum, as it floats to the surface, is driven by the winds to the western and southern banks, where it is collected by the natives, and used as a kind of pitch, as a medicine, and for embalming. But the inflammable solid which seems to constitute compact bitumen or asphaltum is found on the shores of the sea and in the neighbouring hills: it is quite black, takes a fine polish, and is occasionally used for ornamental purposes. These, as far as we are aware, are the only uses to which the asphaltum of Palestine is applied.

The bituminous matter appears from the above details to be in the twofold form of an adhesive pitch and a compact solid. But it is more frequently found combined with rocky substances into a hard coarse mineral. The most remarkable accumulation of this kind is in the island of Trinidad, of which a minute account has been given by Dr. Nugent, and of which we must here present the chief features.

Trinidad is a long narrow island near the coast of South America, and not far from the Gulf of Paria. On a headland about eighty feet above the level of the sea is a spot called the *Pitch Lake*, from the nature of the material composing it. On approaching the spot, a strong sulphureous and pitchy odour is perceptible; and the eye presently descries a dull plain, somewhat like an expanse of still water, frequently interrupted by clumps of dwarf trees or islets of rushes and shrubs. This apparent lake, however, is soon found to be nothing but a plain of mineral pitch with frequent crevices and chasms filled with water. The surface has an ashy hue, and the hardness or firmness seems to depend on the season of the year. When Dr. Nugent visited it (in the month of October), the surface was not slippery or polished; the substance was not adhesive to the foot; the foot made a slight impression; no tremulous motion was felt; and the hardness was such as to bear any weight to which he could subject it. But in the hot season the surface appears to be much more yielding, and approaching to the fluid state; for pieces of wood and branches of trees become imbedded in it. The surface is everywhere intersected by rents and chasms filled with water; the chasms varying in depth from a few inches to several yards; and it is remarkable that the water contained in them is perfectly free from bituminous taste or odour, and is used by the inhabitants of the neighbourhood for washing, cooking, bathing, &c. These crevices are frequently altering their form and course; for in the warm season, the two margins of a crevice have a tendency to coalesce and close the opening.

The extent of this mass of matter is supposed to be about three miles in circumference, being bounded on the north and west by the sea, on the south by a rocky eminence of porcelain jasper, and on the east by the usual soil of the country. Its depth could not be ascertained by Dr. Nugent; for no substratum could be discovered; indeed the mineral itself seems to form the substratum of the neighbouring soil, so that the extent is much more than meets the eye. Some parts of the bitumen are slightly covered with earth, and here are found long grass and shrubs, cassava, plantains, and pine-apples, as well as birds of exquisite plumage.

The appearance of this substance differs considerably in different spots. In some parts it is black, with a splintery shell-like fracture; of considerable specific gravity; having little or no lustre; bearing some resemblance to coal; and capable of bearing a severe blow with a hammer. In other parts it is so much softer that it can be cut with a spade, and then exhibits a vesicular and oily appearance in the interior: this is the degree of consistency of the greater part of the lake. Lastly, there are some spots where the bitumen is so fluid that it may be laded up. The odour in all these cases is that of combined sulphur and pitch; and a piece of the bitumen, when held in the flame of a candle, melts like sealing-wax, and burns with a light flame. Mr. Hatchett, from a careful analysis of the various kinds of bitumen procured from the lake, was of opinion that the greater part of it is not pure bitumen, but is a kind of porous argillaceous stone, impregnated with the inflammable matter, and that the liquid portion is a kind of petroleum, contained in fissures between the more solid parts.

It is not to be expected that such a phenomenon would escape the inquiries of geologists, or be left without an hypothesis to explain its formation. Some have supposed that the bitumen arises from the action of subterranean fires on beds of coal. Others have thought that the vast mass of vegetable and earthy matter brought down by the river Orinoco, and deposited near the island, has been gradually acted on by volcanic fires,—upheaved,—and converted into a bituminous state. But the means are not yet at hand for coming to a correct decision on this point; for the lake does not seem to occupy the mouth of an exhausted crater, nor is the hill itself, on which the lake stands, of volcanic origin. Yet a continual progress or motion seems to exist in the middle of the lake; and an immense quantity of pitch has, at some past period, flowed over the neighbouring country.

The softening of the bitumen by the action of the summer heat seems to show that if the substance is not wholly pitchy, a large portion of it must be so. It is said that if a square be cut out with a spade, the hole speedily closes in, and is no longer visible. When the Spaniards had possession of the island, they wished to apply the bitumen to some economical uses; but having erected their cauldrons on the lake itself,—trusting to its firmness,—they found that during one night the cauldrons had sunk into the lake and completely disappeared. Sir J. E. Alexander states that some time ago a ship of war landed casks to fill with the pitch, for the purpose of transporting it to England; the casks were rolled on the lake, and the hands commenced filling, but a piratical craft appearing in the offing, the frigate, with all hands, went in chase; on returning to the lake, all the casks had sunk and disappeared.

One of the most remarkable circumstances connected with this lake is, that the water in the fissures seems to have a connection with the sea; for marked poles have been thrust into them; and some time afterwards have been found on the neighbouring coast of the sea. Small alligators, which must evidently have come from the sea, have sometimes been found in the watery fissures.

With regard to the employment of this substance, Dr. Nugent, who wrote some years ago, was very sanguine. He states that it is universally used at Trinidad wherever pitch was required; a little oil, tallow, or common tar being used to give it a sufficient degree of fluidity. He adds that "this vast collection of bitumen might, in all probability, afford an inexhaustible supply of an essential article of naval stores, and being situate on the margin of the sea, could be wrought and shipped with little inconvenience or expense." It appears however that this expectation has not been realised; for Admiral Cochrane having sent two shiploads of the bitumen to England for trial, it was found, after numerous experiments, that so large a quantity of oil was requisite, in order to make the bitumen fit for use, that the expense of oil alone exceeded the price of pitch in England.

There is another mode of employing it, however, to which we may briefly allude, viz., the forming of a road-cement. Nearly forty years ago, Mr. Tobin suggested that this substance might be employed for pavement; but the subject appears to have slumbered after that time; for we meet with no renewal of the idea till very recently. Mr. Montgomery Martin, in his valuable 'History of the British Colonies,' says: "I am indebted to Major-General Sir Lewis Grant, late governor of

Trinidad, for the following curious fact:—The pitch of the lake has been adopted for the improvement of the roads, particularly in the fertile district of Naparima, where it was brought for the purpose from La Brea. In the wet season, the roads at Naparima are almost impassable at those parts where there has been no application of the pitch; but where the pitch has been applied, which is the case for several miles in North Naparima, there is a hard surface formed, which makes transport comparatively easy, both from the support afforded and from the little friction of the hardened pitch."

This brings us to the employment of bituminous earth as a cement, a subject which has recently occupied much attention, but the consideration of which we must defer to another number. There are other pitch lakes, or large accumulations of bituminous matter, in different parts of the earth, the nature of which nearly resembles what has already been described.

THE SISTERS OF CHARITY.

The nursing or tending the sick is essentially the province of women; men have neither the gentleness of demeanour, the intensity of sympathy, the perseverance, nor the physical adroitness necessary for the task. We imagine there are few of our readers who have not, some time or another, experienced the peculiar solace derived from female aid in moments of bodily suffering, or during the tedium of protracted indisposition. The occupation, although necessitating some menial services, is an important and honourable one, and every medical man will testify how much depends upon the nurse in the treatment of severe diseases; for while, on the one side, she may be, as it were, his right hand, carrying out and fulfilling the suggestions of his skill and experience, so, on the other, she may become the very marplot of his views, and substitute for his directions the plans dictated by a conceited ignorance. It is not the desire to do well even that suffices, for while the philanthropist is gladdened by observing the sacrifices friends, neighbours, or even strangers often make in their attentions upon the sick, he too often has to lament that, by the wrong direction which has been imparted to these, the good proportioned to their extent has not always followed, and that sometimes positive evil has resulted. Knowledge here, as in all other cases, is required for the means employed to be turned to the best ends, and for the want of this knowledge the evils inflicted by ignorant nurses in this country are great, to an extent that can only be known by those whose occupations call upon them especially to observe them. It is not our intention here to discuss the remedy for this state of things, but we may observe that the magnificent hospitals in which this country is so rich might easily be converted into schools for the educating and training an adequate number of nurses for the wants of the public. Before this can come to pass, however, the emoluments paid to this useful class of servants in those institutions should be increased, in order to induce persons of a higher grade to enter their service, which few now do who can obtain any other means of subsistence.

Our object in this article is to bring before the reader a short account of the religious societies of women which are found in France and some other parts of the Continent devoting themselves to the care of the sick and poor. It is quite true that the ideas of the duties of religion and of society prevalent in this country disapprove of and discountenance all descriptions of monastic institutions, as encouraging an evasion of the obligations of life, yet we feel certain that a very different feeling must prevail in regard to an association instituted expressly for the active performance of some of the most important offices human beings can render to each other.

Although various other societies of women, under the name of Hôpitalières, had done duty in the hospitals long prior, the Sisters of Charity, properly so called, were organised by the benevolent Vincent St. Paul, in 1634, and soon spread themselves, as did other societies formed in imitation of them, over the whole of France and various parts of Europe. They still continue, and in full activity. "They have survived," says Fodcré, "all revolutions, while the Brothers of the same name have long ceased to exist, the spirit of worldliness and of self-interest having triumphed over these last."

The costume is simple, consisting of a black serge gown and a white head-dress. Vows were never made for perpetuity, and a decree of 1809 determined that a novice could not contract an engagement before the age of sixteen, and then only for one year: at the age of twenty-one they may take the vows for five years. The engagement must be made in presence of the civil and ecclesiastical authorities. The Sisters retain full power of disposing by will of all property they possess, and as a society the Order is not entitled to hold any. They form a most numerous body, consisting of several thousands; and above three hundred houses of refuge, hospitals, &c. in different parts of France are supplied by their means with attendants. When they become attached to an hospital, they are submitted to two jurisdictions, that of the bishop in whose diocese it is situated, and that of the administrator of the hospital, to whose regulations they must strictly conform. A general hospital council regulates the number to be employed. They are fed and lodged by the institution, and receive a trifling sum (about ten francs a month) for clothing. An ordonnance of 1821 decrees that those sisters who, from age or infirmity, become incapable of further service, are to be still maintained by the institution, under the name of Reposantes; but, if they prefer it, they may retire upon a small pension, proportionate to the length of their services and the funds of the hospital.

Originally, the congregation of the Sisters of Charity consisted of females of such a station of life that, while they comforted and consoled the poor, they could not descend to the performance of the more menial offices. Afterwards women of an inferior rank were admitted for these purposes; and were soon after formed, under the jurisdiction of Vincent St. Paul, into a distinct society, known as "Servantes des Pauvres de Charité."

We have already said that there are several distinct congregations known under different names (as the Sisters of Mercy, of St. Laurence, of St. Martha, &c.), but they are all alike in the objects they have in view and the means of accomplishing them. These objects are of the highest nature, being the full carrying out of some of the principal precepts commanded by the Christian religion. Wherever want, sickness, or misery is present, there will be found these excellent women, assuaging at once mental anguish and physical distress. They are not confined to the hospitals, but are found in every parish; and after distributing succour to such as are able to come for it, they traverse the streets, lanes, and courts, in order to visit those who are not. Offices the most revolting are performed by them with cheerfulness, and their arrival is always looked for as conferring at least temporary happiness upon the miserable invalids. The foundling hospitals and prisons are continually attended by them: but perhaps it is among the prisoners at the hulks that their most trying duties are encountered, where their kind attentions and entreaties are too often replied to but by horrid blasphemies and imprecations. They follow the armies, and thus render inestimable service to the wounded soldiers, services which are not confined to their own countrymen, for many an English family owes to the careful attention of a Sister of Charity the eventual restoration to its bosom of some one of its members. Many a delicate woman has fallen a victim to the fatigues and privations inseparable from a military campaign. In the time of plagues and epidemic visitations, the con-

duct of these women has frequently been heroic, great numbers falling sacrifices to their charitable attentions. The merit of the Sisters of Charity is the greater, because in many instances they voluntarily resign all the pleasures and comforts of an elevated rank, to submit themselves to suffering and privation for the sake of their fellow-creatures. Their information on various subjects connected with botany and the elements of medicine is often considerable; so that, in case of need, they are frequently enabled to perform various of the inferior medical duties. In every parish they have a receptacle for medicines, whence they distribute them, with other necessaries, to the poor. For admission into the order, their families must have been spotless in reputation; while the daughter of a bankrupt, or any one who has been in service, is prohibited from entering.

Of course, actuated by such excellent motives in entering upon their duties, and presented with such numerous opportunities for their exercise, many of the Sisters have rendered themselves especially remarkable; but perhaps no one has done so more than Sister Martha, whose reputation has indeed become European. Her conduct during the various campaigns and at the plague of Barcelona are only to be exceeded by the nature of the recompense she chose, namely, the pardon of a soldier condemned to death by a military tribunal. This excellent woman died at Besançon, of the consequences of the plague which she herself had contracted at Barcelona.

Voltaire, speaking of the Sisters of Charity, says:—"Perhaps there is no grander sacrifice in the world than that made by a delicate sex—beauty, youth, and often high birth—in solacing in an hospital that assemblage of human misery whose very appearance is so humiliating to our pride and revolting to our delicacy." Dr. Johnston, in his 'History of the Public Charities of France,' expresses himself as follows:—

"Of these persons, none deserve notice more than the Sœurs de la Charité, who may be said to have quitted the world to devote themselves to the relief of the unfortunate persons who people these abodes of misery. Even in times when religion was almost a by-word in France, and when its ministers were abused and trodden down by a misguided populace, a certain share of respect was paid to these congregations of charity, who made it the business of their lives to comfort the sick and afflicted. Mingling zeal with gentleness, they have spent the best portions of their lives in the midst of much that is disgusting and revolting, and have rendered services to humanity which must merit eternal gratitude. They have also introduced into the establishments economy and regularity; and, in that respect, are as valuable to the administration as to the sick. Possessed of superior education, and, from their religious profession, placed above many of the worldly considerations which must affect nurses in general, the Sister of Charity, acting at once as a spiritual and corporeal comforter, watches over the sick bed, soothes the prisoner in his cell, and penetrates the worst abodes of misery to comfort the distressed and instruct the ignorant. Wherever they have the management, cleanliness and good order are conspicuous; while other establishments, in which they are not engaged, present a marked inferiority in these respects."

Effects of War.—The crowds of peasantry that made their way to the capital (Lisbon, in 1829) from the country, flying from their foes, accumulated as the enemy closed in upon the environs of the city: the distress of many was pitiable; they had left all behind them, and were literally without any support but the casual benevolence of a few, who had so many calls upon their humanity, that their means were speedily exhausted. Many of great respectability were reduced to the extremity of begging of our countrymen: it was melancholy to witness well dressed Portuguese watching the opportunity of whispering their tales of distress and petitions for aid in the ears of the English, hoping to escape the observation of the passers-by and their own country people. The man who could resist the appeal of interesting females, the withering look of agony and humiliation which marked their countenances, as they implored relief for some cherished object perishing with hunger and misery, must have been made of sterner stuff than usually forms the component parts of our nature. The calamities of the inhabitants of a country exposed to war are severe: friends and foes must alike be provided for, and all the means in their possession are relentlessly demanded, and carried off; any hesitation or refusal only subjects them to rougher treatment and exactions. Lisbon was full to overflowing with the unfortunate refugees; there was not house-room for the poor wretches, and many had to fight with the mongrel curs that swarmed the streets for their lairs on the quays, and wherever the smallest shelter could be obtained: the sight was truly distressing.—*Recollections of a Naval Life.*

Coffee-Shops in London.—Several coffee-shop keepers who gave evidence before the Committee on Imports showed that the establishment of coffee-shops had been the means of creating improved habits among large classes of the community. Twenty-five years ago the number of coffee-shops in London to which respectable artizans could resort did not amount to twenty, and there were none for the more humble of the labouring classes. The number of coffee-shops in London is now from 1600 to 1800, affording accommodation to persons of every class. Mr. Humphreys, a coffee-shop keeper, said, "About twenty-five years ago, there was scarcely a house in London where you could get any coffee under 6*d.* a cup, or 3*d.* a cup; there are now coffee-houses open at from 1*d.* up to 3*d.* There are many houses where the charge is 1*d.* where they serve from 700 to 800 persons in a day. There is Mr. Pamphilon, who charges 1½*d.* a cup, and he has from 1500 to 1600 persons a day." Some of these shops are open from four in the morning until eleven at night. At one coffee-shop forty-three London daily papers are taken, and an individual who pays 1½*d.* for a cup of coffee has the opportunity of reading any of them. In addition to these daily papers, seven country papers are taken, six foreign papers, twenty-four monthly magazines, four reviews, and eleven weekly periodicals. Another coffee-shop keeper stated that prior to the reduction of the newspaper duty he paid 400*l.* a year for newspapers and magazines, and for binding the yearly volumes. Mr. Humphreys remarked, that since he had been in business, a manifest improvement had taken place in the taste of literature amongst the classes who frequent his house. No intoxicating liquors are sold in the great majority of the coffee-shops, while in the accommodation which they afford, they are far superior to the public-houses. At Mr. Letchford's coffee-shop, in High Street, St. Giles, which is frequented daily by from 700 to 900 hard-working men, the charge for a cup of coffee in the different rooms is 1*d.*, 1½*d.*, and 3*d.* "A man comes in the morning at four o'clock, and has a cup of coffee and a thin slice of bread and butter, and for that he pays 1½*d.*; and then again, at eight, for his breakfast, he has a cup of coffee, a penny loaf, and a pennyworth of butter, which is 3*d.*; and at dinner-time, instead of going to a public-house at one o'clock, he comes in again, and has his coffee and his bread, and brings his own meat." Nine daily papers are taken at this house. The general practice of the trade, when coffee is sold for 1½*d.* a cup, is to charge 2*d.* for tea; and at Mr. Letchford's, the consumption of coffee is two-thirds, and of tea one-third. Within the last few years most of the keepers of coffee-shops have been compelled, by the general demand of the persons frequenting them, to sell cooked meat. At Mr. Humphrey's house about three cwts. of ham and cold meat are sold weekly. Temperance societies and friendly societies are getting into the habit of using coffee-shops for their periodical meetings. Mr. Humphreys, in the course of his evidence, said, "I have often asked myself the question where all the number of persons now frequenting my house could possibly have got their refreshment prior to its being opened. There were taverns in the neighbourhood, but no coffee-houses, nor anything that afforded any accommodation of the nature I now give them."—*Comp. to Alm. for* 1841.

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HORSE ARMOURY IN THE TOWER.—XVII.

[Concluded from No. 557.]

[James II.]

WE now resume our history of armour in England. From the time of James I., the improvements made in the science of war, the new regulations adopted in the management of large bodies of troops, and the rapidly increasing use of fire-arms, caused many of the old weapons to be disused, and with them the necessity for various cumbrous pieces of defensive armour was every day becoming more remote. On the accession of Charles I., armour was very sparingly employed, only the lancers and heavy-horse wearing more than back and breast pieces, and the armour worn by these did not descend below the knee. The pikemen and musketeers wore helmets, and back and breast pieces with tassets, while some regiments of cavalry were only protected by a cuirass over a buff coat.

This last was a favourite dress with many noblemen and officers, and the troops thus habited acquired the name of cuirassiers. Dragoons, first raised in France in the year 1600 by the Marshal de Brisac, were now also a regular part of the English army, and were habited in a buff coat with deep skirts, and an open head-piece with *cheeks*, that is, with iron pieces hanging down by the sides of the face. The cavalry consisted of four corps—the lancers, the cuirassiers, the harquebusiers, and the dragoons. The lancier was habited in a close casque or he d-piece, gorget, breast and back pieces, with pauldrons, vambraces, gauntlets, and tassets; and armed with a sword, two pistols, and a lance eighteen feet long. The cuirassier was habited as we have described him, and carried pistols at his saddle-bow. The harquebusier was dressed similarly to the cuirassier, but carried a harquebuse, two feet and a half long, hung to the belt by a swivel, and pistols. The dragoons bore the short musket called a dragon, and afterwards the caliver, a still lighter piece.

It was about this time that the modern firelock was introduced, said to have been first used by a set of Dutch marauders termed *snaphans*, or poultry-stealers, from whom the name of *snaphaunce*, at first given to this kind of fire-arms, appears to have been derived. They could not afford to purchase the expensive wheel-lock, and the necessity of substituting something in the stead of the match (which frequently led to their betrayal), induced them to adopt a flint for the pyrite, and an upright moveable furrowed piece of steel in lieu of the wheel; the cover of the pan being pushed back, the piece of steel was brought to stand over it, and the spark elicited as at present.

The "Sweyne's feather," called also by the names of the "hog's bristle" and the "Swedish feather" (having

been probably a Swedish invention), was much used during the civil wars. This instrument of offence was in the shape of a long rapier blade, and was made to fix on to the end of the musket, after the piece had been discharged, so that it might be employed as a pike.

Charles I., soon after his accession, caused a survey to be taken of all the arms and armour preserved in the Tower of London, and in the several forts and magazines throughout the kingdom; and in the seventh year of his reign he appointed commissions to proceed over the kingdom in order to prove and put in repair the arms of the militia throughout England, fixing their charges for the repairs of particular portions of armour and weapons. In the reign of Charles II. the military costume differed but little from that of the times of Charles I. and the Commonwealth, except that armour was still less used and the remainder of the dress rendered more ornamental with lace and embroidery. The helmet, with the corslet or cuirass, or the gorget alone, worn over a buff coat, formed the total defence of steel worn by the officers. The principal improvement in arms of this period was the bayonet, which, invented at Bayonne, whence its name, was speedily adopted into most European countries. The bayonet was sometimes flat, sometimes three-edged, and was furnished with a wooden hilt like a dagger, by which it was screwed or merely stuck into the muzzle of the gun. It was not fixed to the gun by the English in the manner in which they are now fastened until after the time of William III. In one of William III.'s campaigns in Flanders, a French regiment advanced against the British 25th with bayonets fixed by a ring over the muzzle. Lieutenant-Colonel Maxwell ordered his men to screw their bayonets into the muzzles of their muskets to receive the French, who he expected were coming to the charge, when the latter suddenly threw in a heavy fire to the astonishment of the British, who could not understand how it was possible to fire with fixed bayonets. They however recovered themselves, charged, and drove the enemy out of the line. This improvement suggested the socket bayonet, which was shortly after invented, and displaced entirely the pike.

In the reign of James II. the helmet was almost wholly laid aside, the full-flowing wig falling somewhat incongruously over the red coat and steel cuirass. The carabineers were embodied in this reign, and were formed into regiments in the reign of William III. They wore breast and back plates, and iron skull-caps sewn in the crowns of their hats. They were armed with swords, and carried pistols in holsters, the carbine slung behind by a belt and swivel. They also wore high black-leathern close-fitting boots reaching to the thigh, in lieu of the buff-leather boots of the Charleses, with their wide-spreading tops.

The figure of James II. in the Tower exhibits the costume of the period, being habited in a coat with the sleeves turned up to show the delicate lawn sleeves, the breast protected by the corslet, and the head by a round steel cap, with a guard or mask for the face. The curious mixture of civil and military costume in this dress must have given a very ludicrous appearance to the troops thus habited.

The incertitude and wayward course of this unfortunate monarch's destiny has caused him to be styled by one of our biographers (taking the metaphor from a print in which he is represented, when young, as playing at tennis) *the tennis-ball of fortune.* "If we take a cursory view of his life," says Grainger, "we shall find that he was seldom or never at rest. Before the death of his father, he was continually hurried to different parts of the kingdom, according to the various fortunes of that prince. After the death of Charles, we see him in Holland, France, Germany, and other countries: now he is an officer in the French army; then a commander in the English fleet. When his brother was in possession of the throne, he was tossed about by faction, and soon after he took possession of it himself, he was driven to France, and thence, by the impulse of Louis XIV., to venture his last stage in Ireland. He was at length thrown into a state prison* at St. Germain's, where he ended his restless life." He abdicated the throne in 1689, and died in September, 1701.

With James II. the series of figures in the Horse Armoury intended to illustrate the progress of armour and military costume in England is brought to a close, and it would be unnecessary for us to pursue the subject further. We have endeavoured to furnish in some degree the explanations which those figures require, and in so doing have attempted to enliven the details of dress and distinctions of armour by glancing occasionally at the characters and actions of the personages supposed to be represented, and by seeking to throw ourselves into the society of their compeers, so as to catch a glimpse at the institutions, manners, customs, and mode of thinking of ages long gone by.

DOMESTIC CHEMISTRY.—No. XIII.

Substitutes for Wheaten Bread.

The quality of bread met with in the large towns of England is generally wheaten, more or less fine according to the admixture of bran with the pure wheat flour. In country places, however, as also in foreign lands, many descriptions of bread are made which merit a brief notice from us.

The inquiries of practical chemists into the comparative nutritive qualities of different kinds of grain have shown that wheat possesses the largest proportion of nutritive matter, but that other kinds are also capable of forming very wholesome bread. Household bread and brown bread, though deemed of inferior quality to wheaten, are still made from wheat flour mixed more or less with bran. The Scotch peasantry, until a comparatively recent period, ate very little wheaten bread. They used to mix a peck of oatmeal with an ounce of salt, and make it into a stiff dough with water, then form it into flat cakes, and afterwards bake it. These oaten cakes, and a somewhat similar kind made from barley, were the substitutes for leavened or fermented bread.

The Cornish miners ate bread made almost wholly of barley instead of wheat. In some parts of the north, peas-meal mixed with oatmeal has occasionally formed the material of bread. Parmentier, the French chemist, proved that potatoes, turnips, horse-chesnuts, briony-root, and other plants were capable of yielding a meal which might be made into bread more or less wholesome. In some cases he cut potatoes or turnips into slices, dried them thoroughly, pounded them, and then mixed them with grain flour; in other cases, the potatoes or turnips were boiled, mashed, and in that state mixed with the flour. A large portion of the bread used in America is made of one-half maize or Indian corn and one-half barley, with a leaven of wheat. One measure of rice with two of barley afford a wholesome bread, as do equal weights of barley and potato pulp, or equal weights of wheat and rye. Grain of rice, the pith of the sago-tree, the root of the mandioc, are all formed in various ways into bread in Eastern countries.

From these details it appears that many vegetable substances are susceptible of conversion into a material for bread more or less salubrious, and it is an object of prominent importance to increase this list, since it is not in human power to command at all times a plentiful return for the labour which the husbandman bestows on his field of corn. The woody parts of trees are obviously the most extended and bulky, and it becomes an object of no small interest to inquire whether wood contains any nutritious principles.

* He himself had been heard to compare the palace of St. Germain's to a prison.

There are two circumstances whereby wood is rendered unfit for food, namely, the foreign matters always mixed with woody fibre, and the compact aggregation of the fibre itself. The former of these obstacles may be overcome by rejecting such woods as naturally contain a great quantity of foreign matter, as the fir on account of its resin, and the oak on account of its tannin, and by removing everything that water can dissolve from the woods chosen. The kinds of wood best answering this description are the birch and the beech.

An attempt to render wood alimentary has been made with considerable success by Professor Autenrieth, of Tübingen. He found it necessary to reduce the wood to a state of extremely minute division—not merely into very fine fibres, but to a real powder. The repeated action of the heat of an oven is likewise required, both to fit the wood for being ground, and to produce some internal change which renders it more digestible. The mode of carrying on the successive processes is as follows:—

The wood is first thoroughly stripped of its bark, and then cut transversely into thin slices about an inch in diameter. These slices are beaten to fibres in a pounding-mill, and then mixed with the sawdust which results from the cutting. The woody particles are boiled in a large quantity of water, in order to remove, as far as possible, the harsh and bitter principles it may contain; or else they are subjected for a long time to the action of cold water, by enclosing them in a strong sack, and beating or treading the sack in a rivulet. The wood is next dried by exposure to the sun or to the heat of a fire, and is afterwards ground repeatedly, till it assumes the form of a rough flour.

The wood-flour is then formed into small flat cakes by the addition of water which has been rendered slightly mucilaginous or gummy. Professor Autenrieth employed one ounce of the roots of the common marshmallow, which rendered eighteen quarts of water sufficiently mucilaginous to make four pounds and a half of wood-flour into cakes. The cakes are baked until they are quite dry and of a brownish-yellow colour; after which they are broken up and ground repeatedly, till the flour will pass through a fine bolting-cloth. According to the hardness or softness of the wood must the baking and grinding processes be repeated more or less frequently. When birch is employed, the labour is much shorter than with beech or other woods of a more compact kind.

The flour thus prepared acquires nearly the smell and taste of corn flour, but never presents the same appearance, being never white, but of a yellowish hue. It does not ferment without the addition of some leaven, and in this case sour leaven of corn flour is the best. With this it makes a spongy and perfectly uniform bread, like common brown bread, and, when thoroughly baked, is said to have a better taste than the bread prepared in times of scarcity from bran and husks of corn. The addition of a little wheat flour is recommended to form a wholesome bread in the following manner:—Two pounds of wheat flour and three pounds of sour wheat-leaven are mixed up with a little wood-flour and milk, and allowed to stand for some hours in a moderately warm place to rise or swell. About fifteen pounds of birch-wood-flour and an additional quantity of milk are then kneaded in, and the dough is rolled out into thin cakes. These cakes are allowed to stand for some time to swell, and are then well baked in an oven. Thirty-six pounds of bread may be produced from the ingredients mentioned above.

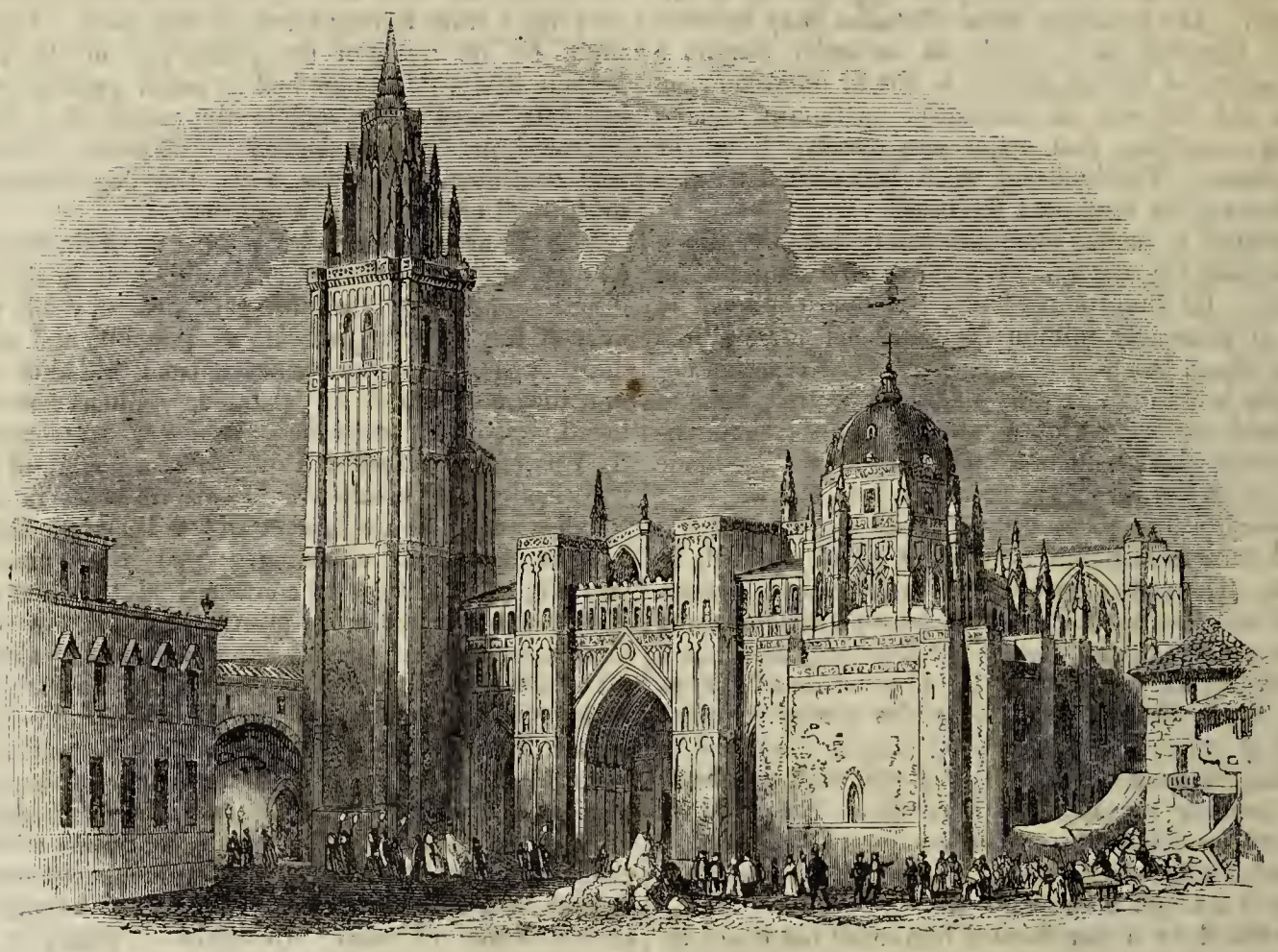
As a proof that wood-flour is both soluble and nutritious, we may mention that starch is obtained from it in the same way as from wheat flour, which with boiling water forms a thick, tough, tenacious jelly. More decisive proofs have likewise been obtained by experiments on animals. Professor Autenrieth tried its nutritious effects on a young dog. He kept the dog a whole day with only water, and then set before him a gruel of indifferently prepared wood-flour, salt, and water. At first the animal ate very little of it, and in the evening was very weak from having taken so little food. During the night he ate freely of the gruel, and in the morning became lively. He now had as much gruel as he could eat four times a-day, and in the course of a few days appeared perfectly reconciled to his diet. This course was continued for seven days, the dog remaining in health and even appearing to grow.

The Professor next tried the effects of the wood-flour on himself and his family. They used it in the form of gruel, soup, dumplings, and pancakes, all made with as little of any other ingredients as possible, and not only did they suffer no inconvenience from this kind of diet, but they also found it palatable. When formed into bread, as before described, Professor Autenrieth first tried its effects by eating a quarter of a pound of it, with weak coffee, for breakfast. The more bread he ate, the rougher and more unpleasant did it become: his throat became somewhat constringed and his stomach oppressed; so that he felt convinced at the time that its continued use would prove injurious to him. At dinner-time, however, his appetite returned, and he ventured to eat of several kinds of soup made of this flour. Finding no inconvenience from this, he ate another quarter of a pound of bread in the evening, with some milk, and no longer found any repugnance towards it or subsequent oppression. He slept well, and arose in his usual health.

Now, from all these experiments, it appears sufficiently evident that a considerable quantity of nourishment may be obtained, but not without trouble and expense, from several kinds of wood. In times of plenty it would be ridiculous to advocate the introduction of such an article as bread made from wood-flour, except for the purpose of showing what may be done in the season of pressing necessity. But were such a season to arrive, the trouble and expense attending the process would be of very trifling consideration, and the lives of numbers might be saved by the knowledge and application of this mode of obtaining bread.

In some districts of Norway and Sweden the bark of trees is converted into bread, which, from the bitter and astringent principles generally residing in that part of the tree, is far less palatable than bread made from wood-flour. According to Von Buch, the mode of making bark-bread in Lapland is as follows:—When young and vigorous fir-trees are felled, the tree is stripped of all its bark, and all the outer parts peeled away, except an innermost rind, which is extremely soft and white. This is hung up for several days in the air to dry, and is afterwards baked in an oven, then beaten on wooden blocks, and pounded as finely as possible in wooden vessels. The pounded mass is carried to a mill, and ground into a meal something like that of barley or oats. This meal is mixed up with *hexel*, with threshed-out ears of corn, or with a few moss-seeds, and cakes about an inch in thickness are formed of this composition. "Nature," says Von Buch, "receives with reluctance the bitter and contracting food, and the boors endeavour to disguise the taste of it by washing it down with water; but in the beginning of spring, after having lived on this bread a great part of the winter, they become weak and relaxed, and are incessantly tormented with an oppressive shooting and burning about the chest." The Laplanders of Kemi Lappmark are described as using bark in a still more crude form. During the summer they peel off the innermost bark of the fir, divide it into long strips, and hang them in their dwellings for winter store, subsisting meanwhile almost entirely on fish. In winter, when their supply of fish fails, they cut these strips of bark into small pieces, and boil them with water and reindeer tallow for several hours, till in consistency they form a thick kind of broth.

THE CATHEDRAL OF TOLEDO.



[Toledo Cathedral.]

Of the ancient glories of Toledo, the once wealthy and magnificent capital of Spain, how little now remains! The sumptuous palace of the kings of Toledo and of their successors the kings of Castile—the Alcanzar—now forms a sort of house of industry for the poor; the population, from two hundred thousand souls, has dwindled away to scarcely one-eighth of that number; the silk and woollen manufactures, formerly employing, it is said, nearly forty thousand men, have almost if not entirely disappeared; and the narrow, winding, dirty, and half desolate streets show but too clearly that no new elements of social power and prosperity have arisen to compensate for the loss of the old. The famous sword-manufactory still exists, and to a certain extent preserves its original reputation: in almost every other respect, the trade, commerce, and wealth of Toledo are but shadows of what they were. Among the monuments of that former period which still exist to illustrate and confirm its brilliancy, the chief are the Alcanzar before mentioned, and the cathedral which we now proceed to describe.

A church, it appears, occupied the site of the present edifice so long back as the sixth century, and which, at the period of the Moorish conquest of Toledo in 1711, was converted into a mosque. For nearly four hundred years it remained thus appropriated to the Mohammedan worship, but in 1085, Alfonso or Alonso, the first king of Castile, having taken Toledo after a three years' siege, the church was again restored to the Christians, though under circumstances not very honourable to them. Alfonso had guaranteed, by the terms of the capitulation, the use of the church to the Moors, but no sooner had he left the city, than his queen, at the instigation of the Archbishop Bernard, sent a party of soldiers, who drove out the Mussulmans then at their devotions. The edifice was immediately purified, temporary altars erected, and a bell placed in the tower, which, on the following morning, to the surprise of the whole city, was heard summoning the Christians to morning prayer. When Alfonso was informed of these proceedings he was so indignant that he immediately returned to Toledo, and, although the priests advanced to meet him, arrayed in deep mourning, to express their contrition, they were only saved from punishment by the entreaties of the Moors themselves, who, dreading the power of the priests, thus nobly as well as wisely sought to allay their bigoted intolerance: for the same reason they also resigned their past claim to the church. In the early part of the thirteenth century, during the reign of Ferdinand III., king of Castile, called also *Saint* Ferdinand from the admirable qualities he displayed, the edifice was rebuilt and enlarged: the old church was transformed into a stately and magnificent cathedral. The successors of Ferdinand from time to time enriched it with every possible kind of decoration, until the building ultimately assumed the aspect that it at present bears.

"I was not long in Toledo," says Mr. Inglis,* "before visiting the cathedral, which has no rival but that of Seville in its claims to be the greatest and most magnificent of Gothic temples. All the cathedrals I had ever before seen shrunk into insignificance when I entered the cathedral of Toledo." Other travellers speak with equal enthusiasm of it. The dimensions of the interior are as follows: length 408 feet, breadth 206 feet, height of the central nave 160 feet. There are five distinct naves, formed by the walls and by four rows of columns. The latter, which are very massy (those nearest the walls measuring no less than forty-five feet round), are placed at distant intervals, and consist of a pier supporting a shaft or pillar, which is single, and not, as in most Gothic churches, clustered. The magnificent effect of the original plan has been much lessened by the numerous divisions into which the interior has been cut up by the choir, and by the different altars erected in various parts, and, above all, by the "detestable transparente," or screen, erected, at a great expense, in modern times as a mystical representation of the sun striking upon the great altar,

* 'Spain in 1830,' vol. i., p. 384.

which is effected by a miserable contrivance. In spite of these blemishes, however, the edifice is still what Mr. Inglis so emphatically terms it, one of "the greatest and most magnificent of Gothic temples." Its amazing extent, the solidity of the gigantic columns which support the roof, and the beauty and variety of those which surround the choir (one hundred and fifty-six in number), the gorgeous splendour of the painted windows (of which there are no less than sixty-eight), and the decorations thrown with an almost reckless profusion over every part, excite the wonder and admiration of every beholder. And when seen under the circumstances described in the following passage, dull indeed must be the soul in which the cathedral does not raise feelings of a still more lofty and permanent character :—"The last evening I remained in Toledo (we again quote from Mr. Inglis's interesting work), I walked into the cathedral some time after sunset,—it was the latest visit I had made to it: the interior was all wrapped in deep dusk; the lofty aisles stretching darkly beyond, only shown by the solitary lamp burning before the shrine of some inferior saint, its ineffectual light dimly falling athwart the gloom; the painted windows had ceased to throw their gorgeous hues within, but a speckled and faintly coloured gleam fell upon the upper part of the columns. Two candles burnt before the altar major; and in the distance, at the farthest extremity of the church, a bright red blaze flashed across the aisle and between the massive pillars, throwing their broad shadows across the marble-checquered floor of the church: this was the Chapel of the Miraculous Image, lighted up with an infinity of tapers; and the only sound to be heard, save my own footstep, was the distant hum of prayer from the many devotees prostrated before her shrine. Here and there, as I walked through the aisles, I saw a solitary kneeler at the altar of a favourite saint; and at some of the remotest and obscurest spots, a cloaked caballero was waiting for good or for evil." *

The cathedral contains many interesting antiquities. Among various other uncouth figures in the choir, there is one representing the Moorish shepherd who was compelled by Alfonso VIII. to guide him and his army through a previously unknown pass in the Sierra Morena, by which means Alfonso was enabled to fall suddenly upon the Moorish hosts, and gain the bloody battle of Las Navas de Tolosa. Here too are the tombs of four of the old kings of Castile, and the tomb of one of the most illustrious prelates of the see, Cardinal Mendoza. Several of the chapels of the cathedral also contain interesting monuments. In that dedicated to the Virgin, Cardinal Portocarrero is interred, with the deeply expressive epitaph—"Here lies dust, ashes, nothing." In the chapel of St. James we find the magnificently decorated tombs of the ten later kings and queen of Castile, and also of Don Alvar de Luna; the last covered with pompous inscriptions that seem little else than a satire upon that unfortunate nobleman when considered in connection with his fate: raised by the favour of John II. to the highest possible pinnacle of rank and power, he was ultimately left by the same monarch to perish on the scaffold. The ceiling of the vestry is beautifully painted in fresco by Luca Giordano. On one side of the cathedral is a square court enclosed by ranges of columns and a covered cloister. The latter is very large, and of noble proportions; its date is later than the church. On its walls, the two best Spanish painters of the last century, Bayeux and Maella, have traced the history of St. Eugenius and St. Leocadia, the patrons of the cathedral, as well as of other saints famous at Toledo. It is much to be lamented that these beautiful works should be exposed to the open air, and to the premature decay which such a circumstance must produce. In the same place there is a painting, the subject of which is sufficiently disgusting, but which is at the same time admirable for vivacity and general excellence of execution. The story embodies the charge which was so continually raised against the Jews during the middle ages, of crucifying a child, and which, with but slight alteration, we have recently seen revived in Damascus with nearly all the original cruelties. How long this idea has survived the effects of superior enlightenment and a worthier estimation of our fellow-men, may be seen in Spain as well as at Damascus; the child referred to in the above picture was kidnapped, it is said, from the village of Guardia, and even to this hour "the little one of Guardia" is held in the greatest adoration in his native place. The central part of the court forms a delightful garden, planted with odoriferous shrubs and fruit-trees, and having in the centre a fountain. As we have already seen in our recent account of the Mosque of Cordova, the entrance to the Moorish religious temples generally ran through a garden or court of this kind: to them, therefore, Toledo is most probably indebted for this interesting appendage to its cathedral.

Among the curiosities of the cathedral, the chief are the "preciocidades," which cannot be seen without an express order to that effect. Nor will such a precaution seem extraordinary when we perceive the almost incredible value of the things included under that name. The cathedral of Toledo is unquestionably the richest in the world. Our space will only allow us to mention a few of the precious articles here preserved. The mantle and crown placed on a silver figure of the Virgin on particular occasions are the first in point of value. The mantle is of satin, but so completely covered with precious stones that no part of it is visible; we see simply a groundwork of pearls, studded all over with emeralds, rubies, topazes, and diamonds. The crown also, though of pure gold, is entirely concealed by jewels of the largest size and most brilliant character, sapphires, emeralds, rubies, and diamonds, and surmounted by an emerald of extraordinary beauty. On high days, the silver image of the Virgin, wearing the robe and crown, and holding in its arms an infant of solid gold, and adorned with eight hundred jewels, is placed upon a silver throne weighing more than half a ton, and borne upon men's shoulders through the streets. The next in value is the Custodia used for the exposition of the sacrament, which weigh no less than seven thousand ounces, and is entirely formed of silver and gold, studded with jewels. In the centre is a shrine of gold weighing fifty pounds. It is, if possible, however, still more valuable for the workmanship than for the materials, being constructed of very small pieces, which, when screwed together, form a Gothic tower covered with the most exquisite fretwork. There are also images, urns, &c. of pure gold, almost without number, many of them studded with gems. In the urns are contained the relics of the cathedral, which include something of almost every saint in the calendar: that of St. Casilda must not be overlooked, were it only for the legend with which it is connected. San Ildefonso, a distinguished archbishop of the see, having written a work in defence of the immaculacy of the Virgin, St. Mary was so pleased that she sent St Casilda (thus runs the legend) with a highly complimentary message, which was delivered whilst the archbishop was performing mass in the presence of the king and his court. Ildefonso, to silence all cavillers as to the fact of this visit (for we presume the saint was invisible to all but him), asked the king for the knife he wore at his girdle, and cut off with it a part of St. Casilda's veil. Not satisfied with this, the Virgin subsequently appeared in person to Ildefonso, to express her acknowledgement, and threw over him a garment of heavenly manufacture. The veil and knife are still shown as proofs of the truth of the story, as are also the marks of the Virgin's feet deeply imbedded in the stone where she alighted, but the garment was carried to Oviedo during the Moorish invasions, and has there remained ever since, the inhabitants refusing to give it up. It is even stated that a proposal of

* Inglis's 'Spain,' p. 388.

that nature had once nearly thrown the people of Oviedo into insurrection. The riches of Toledo had a narrow escape during the period of the French occupation. The archbishop had previously conveyed to Cadiz all the portable articles, the rest he could not remove; the French, however, accepted the trifling sum of two thousand two hundred and fifty pounds of silver in lieu of all the immense wealth that was in their grasp. Every article is inventoried and valued in a proper book; and "although," says Mr. Inglis, "my informant did not state to me the precise amount of the whole, he said it exceeded forty millions of ducats, or ten millions sterling of English money!" But we may say in conclusion, with the same writer, "the preciocidades and marbles and porphyries and paintings are not the most interesting features of the cathedral of Toledo: its immensity, its grandeur, are its glories. The lofty and majestic aisles, the massive and far-stretching columns of a temple like this, seem almost to shadow forth the imperishable nature of the religion whose sanctuary they adorn and uphold. The longer we contemplate the vastness and majesty around, the mind is more and more filled with awe, and lifted from the insignificance of life to a sense of the greatness and solemn grandeur of eternity; we are filled with enthusiasm and admiration,—enthusiasm the more lofty because it is mingled with religion; and admiration the more profound, since it is mixed with astonishment that so frail a creature as man should be able to perpetuate his memory for ever."*

ASPHALTUM, OR BITUMEN.—No. II.

THE ECONOMICAL USES OF ASPHALTUM.

In the last article on this subject we described the nature and appearance of large masses of bituminous earth and rock in different places; and we may now consider the modes in which similar substances have been brought into useful application, especially in France.

It is commonly supposed that such an employment of asphalte is altogether modern; but this is not exactly the case. So long ago as the beginning of the last century, great encomiums were passed on a certain asphaltic cement discovered in Neufchatel in France. A little book was published at Paris in 1721, called 'Dissertation sur l'Asphalte, ou Ciment naturel, découvert dans la comté de Neufchatel;' in which the author, M. d'Eyrings, describes the modes of preparing the cement and of applying it to useful purposes.

The author in his preface says,—"The mine of asphalte, discovered about ten years ago, at Neufchatel, is a treasure for Europe unknown to previous ages; or at least it does not appear that before that time any one had worked it, or that the earth which covers it had been removed." He proceeds to describe this asphalte as a brown, viscous, wax-like substance, emitting an odour something like that of amber; containing an oily liquid in its pores or interstices; and capable of hardening into a durable solid by a certain mode of treatment. "I have seen in Soleure and Neufchatel," he says, "the basins of fountains twelve or fifteen feet in diameter cemented with this asphalte: the stones are as well united as on the first day, and are so perfectly joined that they seem to be one piece; the water is retained as well as in a vase, although exposed to heat, cold, and all the vicissitudes of temperature." M. d'Eyrings proceeds to state that the asphalte must be taken from the rock, broken into small fragments, and finally powdered. Burgundy pitch is then to be melted in a copper or iron cauldron; and when thus melted, the powdered asphalte is to be added by small quantities, and stirred up with a stick. Nine parts of asphalte are to be mixed with one of pitch, and the whole thoroughly melted. The liquid cement is then to be poured into the crevices or openings between stones, and will soon harden into a substance as hard as stone. It appears from this description that he regarded the asphalte rather as a cement than as a substitute for stone; but he conjectures that it might do well, if laid on a substratum of sand, to form terraces and walks, without the intervention of any stones. He mentions the names of several French noblemen who had used the asphalte as a cement for fountains, and speaks with earnestness of the numerous uses of this substance.

We find no mention of this asphaltic rock or mine in subsequent periods; nor was it till about half a century ago that attention seems to have been directed to the extensive use of asphalte in the arts; and even long after that period the subject attracted very little notice. It was, we believe, about 1790 that an accidental circumstance drew the notice of some individuals to the qualities of an asphaltic rock in the south of France, near the banks of the river Rhone. During the removal of some ancient remains of fortification, supposed to be Roman, it was remarked that the stones were cemented together so powerfully that the aid of gunpowder was required to separate them. On examining this cement, it was found to bear a great resemblance to a mass of asphaltic rock in the park of Pyrimont, about five miles from Seyssel. The lower floor of a house near the Rhone in the neighbourhood being damp, it was determined to try whether this asphaltic rock could be melted and applied as a cement to cover it, so as to exclude damp. The attempt appears to have succeeded; and the mineral began to be used for similar purposes among the neighbouring inhabitants. But it does not seem to have been made an object of commercial speculation till about twenty years ago, when a company of persons embarked a certain amount of capital in it. Since that time the property has changed hands, new modes of preparing the cement have been adopted, and the use of the mineral has become extensive in France. The attention of English surveyors and engineers being thus directed to the subject, Mr. Simms, civil engineer, went to France to examine the nature of the mineral, the mode of its preparation, &c.; and from a small pamphlet which he published on the subject in 1838, we obtain a few particulars on these points.

Between Mount Jura and the right bank of the Rhone, not far from the town of Seyssel, the surface of the ground is covered with a sort of bituminous gravel, called *molasse*, the gravel being to a certain extent impregnated with bitumen, and having also veins or fissures filled with this substance. The molasse extends from the banks of the river to the foot of the mountain; and at one particular part a mass of calcareous asphalte, sixteen hundred yards long by six hundred broad, rises up through the middle of the molasse. The calcareous matter of which this rock is formed is whitish on the exterior surface; but the interior is of a deep brown colour, due to a quantity of bituminous matter with which it is impregnated. This asphalte is tolerably equally diffused throughout the mass, but not wholly so; and there is reason to believe that the asphaltic rock forms the substratum on which the *molasse* is situated. If this be the case, the nature of the district may be thus summarily described:—A mass of calcareous rock, impregnated with a certain quantity of bitumen, is covered, except at one part, by a stratum of gravelly soil, still more impregnated with bitumen, the uncovered part being the calcareous rock exposed to view. The calcareous asphalte is found to contain about ten per cent. of pure bitumen, the remainder being carbonate of lime. The bituminous molasse contains from fifteen to eighteen per cent. of bitumen, the remainder being composed of micaceous sand.

In the course of the experiment tried, in order to bring this asphaltic rock into use, it was found that the molasse which surrounds it, or the bitumen contained in the molasse, was useful as a flux to assist in reducing the whole to a fluid state. The compound obtains the name

* Inglis's 'Spain,' p. 387.

of asphaltic mastic; and the mode in which this mastic is made is described as follows:—the materials are conveyed to the spot where they are to be used, and there melted: the asphaltic rock is misshapen masses of about a cubic foot contents, and the bitumen in barrels. The asphalte is merely hewn from the rock in blocks, which are transported to the place where they are to be used: the bituminous matter from the molasse is broken into pieces about as large as an egg; and after being put into boiling water, the particles which rise to the surface are purified by boiling for twenty-four hours, and are then barrelled. The masses are placed in a temporary furnace, about ten feet long and three broad, consisting of a cast-iron trough set in brick-work. A brisk fire being made beneath the trough, the asphalte, as it becomes heated, falls to pieces, and is easily reduced to powder by pounding with a heavy mallet.

The melting furnaces, or cauldrons, are heated by fires underneath, and into each cauldron about fourteen pounds of bitumen are placed. When this is dissolved, the powdered asphalte is added by degrees, till nearly two hundred pounds weight of it have been introduced. These ingredients are well mixed and stirred up, in order to prevent them from adhering to the cauldron; and when the composition has attained nearly to a liquid state, which occurs in about an hour and a half, a small quantity of fine, clean, heated gravel is introduced. The whole is again stirred, and kept heated till it slightly boils, emits a white smoke, and acquires a consistency rather more liquid than that of treacle. It is then fit for use, either to be poured into moulds, or used in any other manner. It will be seen that this mode of proceeding does not greatly differ from that followed by D'Eyrings. a hundred and twenty years ago, except in the employment of molasse bitumen instead of Burgundy pitch.

The extent to which this asphaltic mastic, as it has been termed, has been used in France, is considerable. Paris contains many more public squares, or 'places,' than London; and the surfaces of these squares have been in many instances covered with this mastic. The Place de la Concorde, in the midst of which is the Luxor obelisk, is described by Mr. Simms as being covered in a very beautiful manner. A substratum of lime, sand, and mortar, about three inches thick, was laid over the surface of the ground, and well smoothed at the top. When this was dry, a mosaic pattern was formed by iron bars, about half an inch thick, and into these compartments the liquid mastic was poured. The design consisted of large squares alternately black and white, each square having a circular disk in the centre, of the contrary colour to the square itself. This colour was produced by sprinkling black or white gravel over the surface of the mastic before it lost its adhesiveness, and stamping it into the mastic by means of flat boards attached to handles. When hardened, the whole had the appearance of a black and white chequered granite paving.

Another extensive application of the mastic in Paris is at the long parade on the north side of the palace and gardens of the Tuileries. The footpaths on the Pont Royal, on the Pont de Carousel, on the Boulevards des Italiens, on some of the abattoirs (slaughter-houses), and others, have been formed of this material.

Another employment of the mastic seems to have been for roofing. This is said to have been adopted in many of the fortifications, barracks, arsenals, &c. at Douay, Vincennes, Besançon, Lyon, Grenoble, Peronne, and other places in France. In some of these cases the roof was thus constructed:—Fir laths were laid on the rafters, and on these square tiles of burnt clay, cemented with asphaltic mastic. Canvas was stretched all over the tiles, and properly secured; and on this a layer, rather less than half an inch in thickness, of the mastic was laid; lastly, a fine stratum of sifted gravel was laid on the mastic, and beaten into it while moist.

As a flooring for apartments it has also been used; and for this purpose a mosaic work of a singular kind has been produced. A flat flooring of smooth plaster being formed, any required pattern or device is drawn upon it, and then a thin coating of glue or size is laid on. While this is yet wet and adhesive, small pebbles, of various colours, and flattened on one side, are disposed according to the pattern, and made to adhere slightly to the glue. An iron border is then placed round the collection of pebbles, of a square, circular, or any other shape; and into the moulds thus formed, the melted mastic is poured. When this is cold, the cake or slab is taken up, and its under surface presents a mosaic appearance, the pebbles being interspersed amidst the bitumen, and firmly adhesive to it. These slabs can then be laid down side by side, and cemented together by mastic being poured between them.

Such is a brief sketch of the various modes in which the asphaltic mastic has been employed in France, to which we may add another, that of a cement for securing stones together in the manner of mortar. It is not surprising that the attention of engineers and surveyors in England should be drawn to this matter, considering how important the process of water-proof cementation is in civil engineering. Whoever has looked into the public journals within the last two or three years, will have met with many accounts of the employment of asphalte, or bitumen, as a material for roads. In some cases the material has been derived from Seyssel, in others from other quarters: in some the kind and the proportion of the rocky matter combined with the pure bitumen have been different from others: some of the applications have fully answered the end expected; while others have, from various causes, partially or wholly failed. Into these matters it is not our purpose to enter; the subject has now become one of fair public speculation, and as such it will stand upon its own merits, whether they be many or few. Our object has been to describe the class of bodies to which asphalte belongs, the particular variety which yields the asphaltic mastic, the position and condition in which it is found on the earth's surface, the mode of preparing it for use, and the principal modes in which it has been employed on that country where it has been most used. How far asphaltic substances may be successfully applied in the arts, whether as a material for roads and floors, a covering for roofs, a cement for joinings, or in any other capacity, is a matter for experience and enterprise alone to determine; and practical men will be pretty sure to arrive at the truth by comparing it with other substances employed for similar purposes.

EDIBLE PRODUCTIONS OF THE NORTH AMERICAN FORESTS.

[From a Correspondent.]

In speaking of the North American forests, I refer only to that portion of them connected with the British Colonies there,—or to that section of the United States bordering upon them, extending southward to something below the fortieth degree of north latitude, and where a milder climate works a wonderful change in the various productions of the soil. But in treating of the edible productions of this portion of the American wilderness, I must be understood as including only the wild fruits of the forest and the scanty vegetable productions of the swamps and marshes (for within the limits of this region of country there are scarcely any upland prairies to be met with); and such being the case, the view of the subject will be confined within comparatively narrow limits; for the great Western wildernesses are nearly as barren as the deserts of the East.

In some of the swamps and marshes of the unsettled country bordering on Lake Superior, and still farther to the west,—and, indeed, in some of the less remote and better known parts of Upper Canada,—a species of wild rice has long been known. This plant, like the other species of rice, delights to grow in moist situations; and as these swamps

are never dried up, or parched with the summer droughts, no artificial irrigation is necessary, and if it were so, they would not receive it; for notwithstanding most of the Indians immediately connected with the rice-swamps make use of it more or less, they do not appear to value it so much as to cause them to feel disposed to go far to procure it. Most of the swamps where this wild rice grows are wholly impassable without the assistance of some sort of small craft, and none are better adapted for such a purpose than the small light canoes of the Indians, which they push through the long grass and wild rice with poles, it being next to impossible to use oars or paddles in such situations. At the period of gathering the wild rice, a curious scene sometimes presents itself,—several scores of small canoes, each manned (if the expression may be allowed) by a couple of squaws (female Indians), may be seen poling their way along a level plain, which at a distance has no appearance of water, towards the place where the rice is most abundant. When there is little difficulty in navigating the rice-grounds, and the rice is pretty abundant, a canoe will return home at the end of the day with four or five quarts of rice, in an unhusked condition of course; so that if the parties were anxious to lay in a stock for the winter, in two or three weeks they would be able to do so. This however is no part of the Indian character,—the laying up a stock of provisions of any sort is rarely attempted. But if by accident rather than design the wigwam of an Indian becomes stored with more than an ordinary supply of provisions of any sort,—he becomes wasteful and extravagant, and never once thinks of replenishing his stock so long as anything remains.

The usual Indian method of preparing the wild rice is that of boiling it in their rude earthen pots, after it has been previously bruised in a hollow piece of wood substituted for a mortar; and then mixing therein a little bear's grease, or fat of some other kind, a mess is formed of which some of the tribes of Indians appear to be very fond. As the liquor continues to boil, the husks of the rice rise to the surface, which being skimmed off from time to time, but few of them are found remaining in it when the dish is ready. The persons resident at the fur-stations through the long winters are commonly glad to get a supply of wild rice from the Indians they engage to hunt for them, for it often happens that if they fail in procuring a little of this article, they will have to pass the whole winter season without any vegetable food whatever. And they experience little difficulty in achieving their object when rice is found in any of the neighbouring swamps, for a few glasses of strong spirits, bestowed upon some of the chiefs or leading men in tribe, will procure them what they desire. It is hardly probable that this species of rice will ever become a matter of consideration longer than the country remains in an uncultivated and wild state, for in the vicinity of some of the settlements to the west of Toronto, the capital of Upper Canada, where it grows to some extent, it is scarcely ever gathered, for it certainly is but a poor substitute for wheat, rye, or barley, or even oats, millet, or buckwheat.

Probably the most valuable of the various sorts of wild fruit found in these regions is the cranberry, for it is not only esteemed by the people of the country, but is so well liked that it will bear the cost of exporting to distant towns and cities, and even to foreign countries. Cranberries, like wild rice, grow in boggy or swampy situations, but not where there is an equal depth of water. This small fruit is found, in greater or less quantities, in all our North American colonies,—and it seems to be found only in the colder regions of the earth. But it is not invariably found in the more regular bogs, for although it delights in moisture, it sometimes grows on small hillocks that are covered with a sort of spongy moss. Among the numerous swamps where these berries are found, that extensive and well known one in the Niagara district, Upper Canada, is called Cranberry Swamp, evidently from its abounding in these berries. This swamp or marsh commences near Grand River on the west, and extends eastward nearly to the Chippewa, a distance of nearly thirty miles. Many of the squaws and children of the Indians (the Six Nations being settled along Grand River), as well as the white population from the settlements in its vicinity, repair hither in the autumn to gather cranberries, which, for the most part, they dispose of to the nearest storekeepers, who enclose them in casks and send them off to the Quebec and Montreal markets. In many places the ground is so boggy, that the parties have to provide themselves with light thin boards to stand upon; each individual requiring two—one to stand upon while he pushes the other forward; and yet, in spite of such precautions, few escape being up to their knees or ankles in mud and water. When gathered in small quantities, they are usually picked by hand,—but small rakes, with the teeth set very close together, are sometimes employed where the parties make a regular business of it.

In these forests there is not, generally, much or valuable fruit; but that seems to be the case in all uninhabited countries possessing a cold climate. Of grasses there are a few varieties—none of them, however, even of a tolerable quality; and one occasionally meets with grape-vines which climb the tallest forest-trees, and a single vine will sometimes extend its tendrels over five or six such trees that probably grow two or three rods asunder. Of wild cherries there are several sorts, principally black ones however; but, like the wild plums, of which there are both white and purple varieties, there is not one that is much sought after or greatly esteemed, neither are those of the persimon and the service-tree, which are both common to most parts of the country. Crabs and wild apples are found in many of the valleys, but, with the exception of the Virginia crab, they are held in no repute. There is also a small wild fruit called the prickly pear, which, as the country becomes settled, is often gathered and made into a preserve that is much esteemed in America; but the Americans are noted for their fondness for preserves and sweetmeats, and they consequently are in the habit of preserving many indifferent sorts of wild fruit, which they allege make very good preserves. Besides the wild fruits already enumerated, there are two sorts of raspberries—the red and the purple, growing very abundantly in many places; and bramble-berries of a very superior quality compared to those of our own island. The strawberry too grows wild in many situations, which, with the raspberries, are among the most esteemed of this class of wild fruits.

But little remains to be added upon this head; for, excepting the various kinds of nuts that are produced in great abundance in most parts of the forest, little or nothing that can with any propriety be considered edible remains to be spoken of. The nuts are found according to the nature of the timber that predominates; and what are called pine-districts are nearly destitute of nuts of any description. The hickory nuts—those called the shell-bark—are accounted the best the woods yield, although some persons give a preference to chestnuts, of which some parts of the forests furnish vast quantities. The hickory-nut is a good deal like the walnut, but with a harder shell; and the nut commonly known by the name of butter-nut also resembles the English walnut, but is not of so good a quality. Besides these, there are two or three varieties of hazel-nuts, none of which are much sought after. In some sections of the country beech-nuts are uncommonly abundant, and one sort is larger than the produce of our beech-trees: but these, and acorns, which in some places grow in large quantities, are properly the food of the wild animals of the wilderness, or of the swine that the white people introduce along with them as they make inroads among the forest-trees.

Whittington's Cat.—The fable of the cat, by which Whittington is much better known than by his generosity to Henry V., is, however, borrowed from the East. Sir William Gore Ouseley, in his Travels, speaking of the origin of the name of an island in the Persian Gulf, relates, on the authority of a Persian MS., that in the tenth century, one Keis, the son of a poor widow in Siráf, embarked for India, with his sole property, a cat: "There he fortunately arrived at a time when the palace was so infested by mice or rats, that they invaded the king's food, and persons were employed to drive them from the royal banquet. Keis produced his cat, the noxious vermin soon disappeared, and magnificent rewards were bestowed on the adventurer of Siráf, who returned to that city, and afterwards, with his mother and brothers, settled in the island, which, from him, has been denominated *Keis*, or, according to the Persians, *Keish*."—*Relics of Literature.*

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PUBLIC IMPROVEMENTS.

[Railway Terminus at Blackwall.]

THE rapid manner in which the railway system is coming into operation renders it desirable for us to give some account of the progress of railways up to the present time. The number of miles of railway which have been opened in 1840, has far exceeded in extent the openings of any previous year, being at least 500 miles. Since the opening of the Liverpool and Manchester Railroad, in September, 1830, upwards of 1100 miles of railroad, for the transport of passengers and merchandise by means of steam-power, have been constructed, and are now in actual use; and the lines now in progress are of about the same length. The capital invested in these improvements amounts to not less than 60,000,000*l*. The aggregate length of navigable canals in England is about 2200 miles, all of which have been made since the middle of the last century, the Act for the Duke of Bridgewater's canal having been obtained in 1755. Very little more than twelve years will have sufficed to bring into operation lines of railroad of equal extent. Besides the canals, many rivers have been rendered navigable. The roads and highways of England are not less essential to the economic well-being of the community, spreading as they do into every part, like the minute veins of the body, and giving life to the extremities. A committee of the House of Lords, during the present year, has estimated the length of the turnpike roads in England and Wales at 22,000 miles, and the length of the parish roads at about 104,770 miles. Such a system of road communication has been the work of many centuries.

The effect of canals and roads has been principally to develop the material resources of the country, and to uphold its prosperous condition. The railways will not only have a similar effect, but will exercise a much more powerful influence on manners and institutions. One of our old divines (Bishop Hall) observes, that "Lord Bacon saith truly, there are three things which make a nation great and prosperous,—a fertile soil, busy workshops, and easy conveyance for men and commodities from one place to another; to which (remarks the bishop) let me add knowledge and freedom." We know that in countries less advanced than England one of the most certain means of extending the influences of civilization is to connect the remote extremities with the centres of intelligence. The result in Ireland is well known to have been beneficial; and where the general tone of society is healthy, "knowledge and freedom" cannot but be promoted by whatever accelerates the energy of social life and places the distant parts in more intimate union with the heart and centre.

The public have already made use of railways to an astonishing extent. On the chain of railways connecting London with Birmingham, Liverpool, Manchester, and Preston, which, with the branch to Aylesbury, amounts to an aggregate length of about two hundred and sixty miles, the total receipts for the year ending 30th June, 1840, were 1,467,563*l*., being an average daily income of 4020*l*., or 15*l*. 9*s*. 3¾*d*. per mile. The receipts on the London and Birmingham Railway in the ten consecutive weeks ending 5th September, exceeded, by more than twenty-one per cent., those of the corresponding period in 1839. The receipts per day during these ten weeks were 2490*l*., which was at the rate of 20*l*. 18*s*. 6½*d*. per mile. The proportion of accidents to the number of persons conveyed on railways has been smaller than by any other mode of transit. The number of violent deaths from accidental causes in England and Wales in one year, is about 10,000, according to the Reports of the Registrar-General, and if in each of these cases the immediate cause of death could be ascertained, the fact which we have assumed would, there is no doubt, be clearly demonstrated.

In many of the accidents on railways the sufferers were not travelling on the line by the trains.

It appears that on the London and Birmingham Railway, on which nearly thirty trains a day were travelling, from the 1st of January last to the 1st of November, not one passenger had been in the slightest degree injured, notwithstanding nearly a million persons had been conveyed on the line, and the number of miles travelled amounted to about forty-millions.* We do not despair of seeing judicious means employed to render accidents less frequent; and this object may be attained both by the application of scientific means and by the better training of the servants of railway companies, who have laboured under the disadvantage of bringing a great and entirely new system into operation without that experience to guide them which they are now rapidly acquiring.

The reduction of the rates of postage to a uniform charge of one penny, is not only one of the most gratifying public improvements of the current year, but may be regarded as the recognition of principles which are equally well calculated to benefit the community if acted upon with the same vigour in other departments.

On the 5th of December, 1839, as a preliminary step, the rate of postage was reduced to a uniform charge of 4*d*. per half-ounce. On the 10th of January following, the uniform rate of 1*d*. per half-ounce came into operation, and the use of stamps was introduced on the 6th of May. The number of letters delivered from the post-offices of the United Kingdom under the old, the intermediate, and the present system was as follows:—

Week ended.	No. of Letters.
Nov. 24, 1839 (old rate) . .	1,585,973
Dec. 22, „ (four-penny rate) .	2,008,687
Feb. 23, 1840 (penny rate) .	3,199,637
April 26, „ „ . .	2,954,866†
May 22, „ „ . .	3,138,035
June 21, „ „ . .	3,221,206

This is the latest period to which official returns have been made. The number of letters in the last-mentioned week is at the rate of 167,502,712 letters per annum.

Reckoning those letters only which have been affected by the inland rates of postage, the increase in the number of letters in the United Kingdom was 40 per cent. under the four-penny rate, and 165 per cent. under the penny rate, namely, for England and Wales about 164 per cent.; Ireland, 149 per cent.; and Scotland 234 per cent. When the rate of postage was not affected by prepayment, only 16 per cent. of the letters passing through the General Post Office in London were paid; but the proportion of paid letters is now about 90 per cent., of which 40 per cent. are stamped. In the London district department of the General Post Office, through which about 1,200,000 letters are dispatched weekly through the metropolis and its vicinity, 89 per cent. of the letters are paid, of which 51 per cent. are stamped.

Mr. Rowland Hill estimated the average rates on inland general-post letters at nearly 7¾*d*., under the old system, or, including those sent through the London two-penny-post and the country penny-posts, at nearly 6¼*d*. The present average rate on general-post inland letters passing through the General Post Office, London, is found to be 1½*d*., and on those passing through the London district post the average charge is 1¼*d*. As the increase in the number of letters, instead of being above five-fold, does not at present exceed 165 per cent., the deficiency in the annual revenue of the Post Office will amount to rather more than 1,000,000*l*. But the expenses of conducting the business of the post-office for the whole of the United Kingdom do not exceed 741,000*l*. per annum, and the present number of letters is sufficient to defray the cost of management, and a surplus of above 400,000*l*. a year will accrue besides to the revenue.

In England and Wales nearly one-half of the adult population are incapable of writing; but the existing system of low postage will encourage education; and when once a person has learned to write, it will give him inducements which will prevent the acquirement being forgotten. Even at present there are few individuals in the United Kingdom who have not experienced and acknowledged the blessings of cheap postage. Take the case of a young person who leaves the paternal home and comes a distance of two hundred miles or more to seek a situation in the metropolis. The pain which attends such a separation and the anguish which it produces are now mitigated. Frequent correspondence with home would formerly have been too costly even for persons of respectable position in the middle ranks, but now it may be enjoyed with all its moral advantages and heartfelt pleasures by the poorest classes of the people; while railways render communication so speedy that the old ideas of distance must be modified. A letter written in London at six o'clock in the evening is read at the breakfast-table next morning at Lancaster, two hundred and forty miles distant. Dublin is reached in less than twenty-four hours, and Edinburgh and Glasgow in thirty. One-fourth of the whole correspondence of the United Kingdom is now conveyed on the London and Birmingham Railway.

We cannot leave the subject of Post-office management without adverting to a further valuable improvement which came into operation on the 20th of November, by which, for the charge of 3*d*., any sum not exceeding 2*l*. may be sent to any part of the three kingdoms; the charge for sums above 2*l*. and not exceeding 5*l*. being only 6*d*. The facilities thus afforded to the labouring classes for the transmission of small sums of money for the use of their families will be the means in many cases of saving their earnings from waste and of preserving their families in comfort while compelled to work at a distance from home. Thousands of labourers are employed on railways and public works, many of whom have families residing at a great distance, and often suffering by their absence.

In noticing the Public Improvements of an architectural class we may state that two hundred and fifty-eight churches have now been completed under the Church Building Commissioners, and that sittings have been provided in them for 328,000 persons, more than one-half of which are free. The churches erected by the munificence of private individuals are not included in this return. The Twentieth Annual Report of the Commissioners states that fifteen churches had been completed in the preceding year, nineteen were building, and plans for twelve others had been sanctioned. In the metropolis and its vicinity the following churches are now in progress:—St. Peter's Chapel, Bethnal Green (to contain 1130 sittings); St. George in the East, Watney Street (nearly completed, 1249 sittings, cost 6028*l*.); Lambeth, Park Road (1230 sittings, cost 4100*l*.). And it is in contemplation to erect others at Hackney, Paddington, in Wilton Place (in the parish of St. George, Hanover Square), in the Liberty of the Rolls (Chancery Lane); and several additional chapels and churches in the district of Bethnal Green. That in Wilton Place (to be called St. Paul's, Knightsbridge) will be in the Gothic style. There will be 1600 sittings, 600 of which are to be free. The cost is estimated at 15,000*l*.

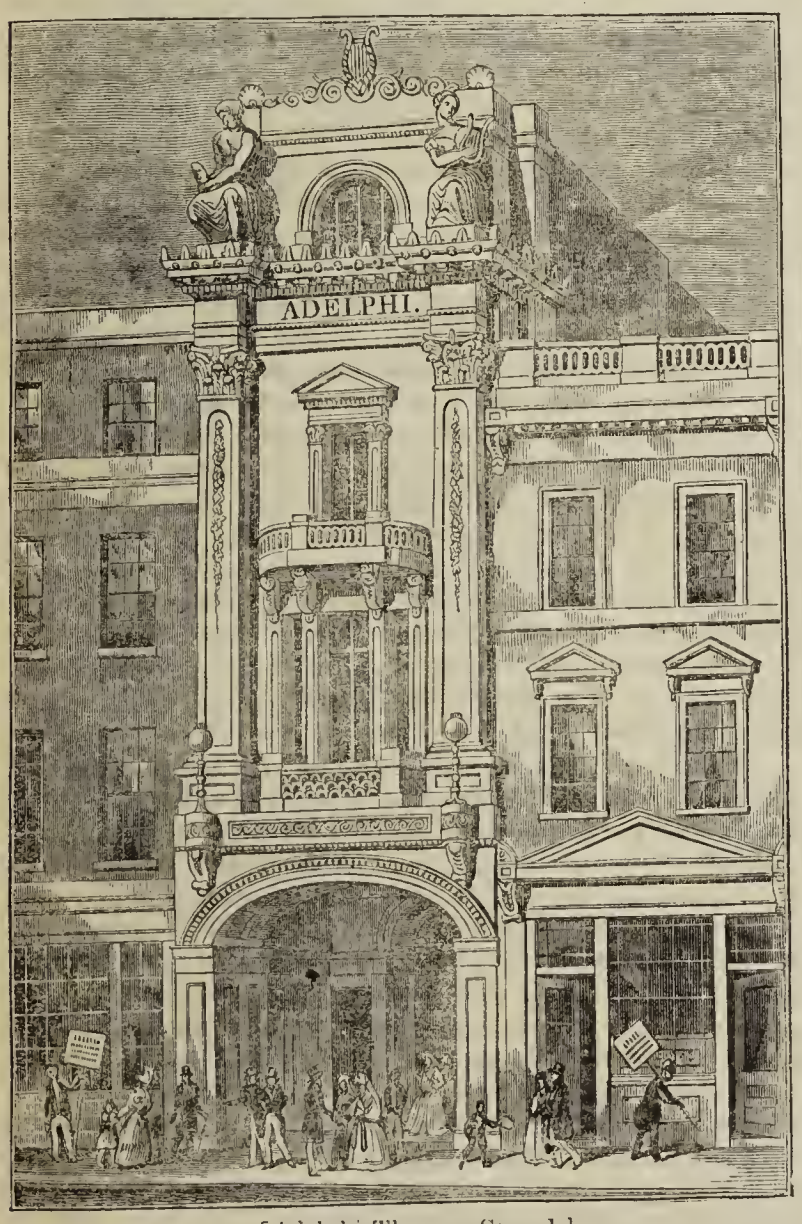
Among the buildings connected with education, St. George's National Schools, Camberwell, are deserving of notice. They are in the later Tudor style, and although

* That is, one person carried 40,000,000 miles, or one million persons carried 40 miles.

† The occurrence of the Easter holidays checked the activity of correspondence this week. On Christmas Day, 1839, the number of London general-post letters (outwards) fell seventy per cent., and the number of district post letters about eighty per cent. On the day of her Majesty's marriage the former fell about forty per cent., and the latter about twenty-five per cent. On St. Valentine's Day the letters by the general post rose five per cent., and those by the London district post twenty-five per cent.

[Camberwell National Schools.]

homeliness is the prevailing character, the detail is bold and good, and the kind of homeliness we here observe is free from that mixture of ostentation and niggardliness jumbled together which is so contrary to good taste. These gables, together with the chimney-shafts, and also the bay windows at the ends of the wings, produce an agreeable degree of picturesque variety.



[Adelphi Theatre, Strand.]

The celerity with which the new façade of the Adelphi Theatre was executed, is almost unprecedented, for the exterior was reared and almost completed within little more than a fortnight. The former front had nothing whatever to distinguish it, except that it was *not* a shop; the present one is remarkably striking. Though very inconsiderable in extent, being only a narrow upright slip of building, and although not without defects as a design, it possesses great character—a significancy of physiognomy that can hardly be misunderstood. The degree of showiness observable in it, and which might else be objected to as exuberant, here becomes rather a merit than a fault. The excessive width of the arched opening below, however, is such as to cause that part of the building to look a mere gap, even to the appearance of insecurity, and all the upper part to appear heavy in comparison, and what renders this defect all the more offensive is, that it is attended by a very gross violation of architectural principle, the two pilasters above being considerably wider than the piers below, whereas the difference in this respect ought to have been just reversed.

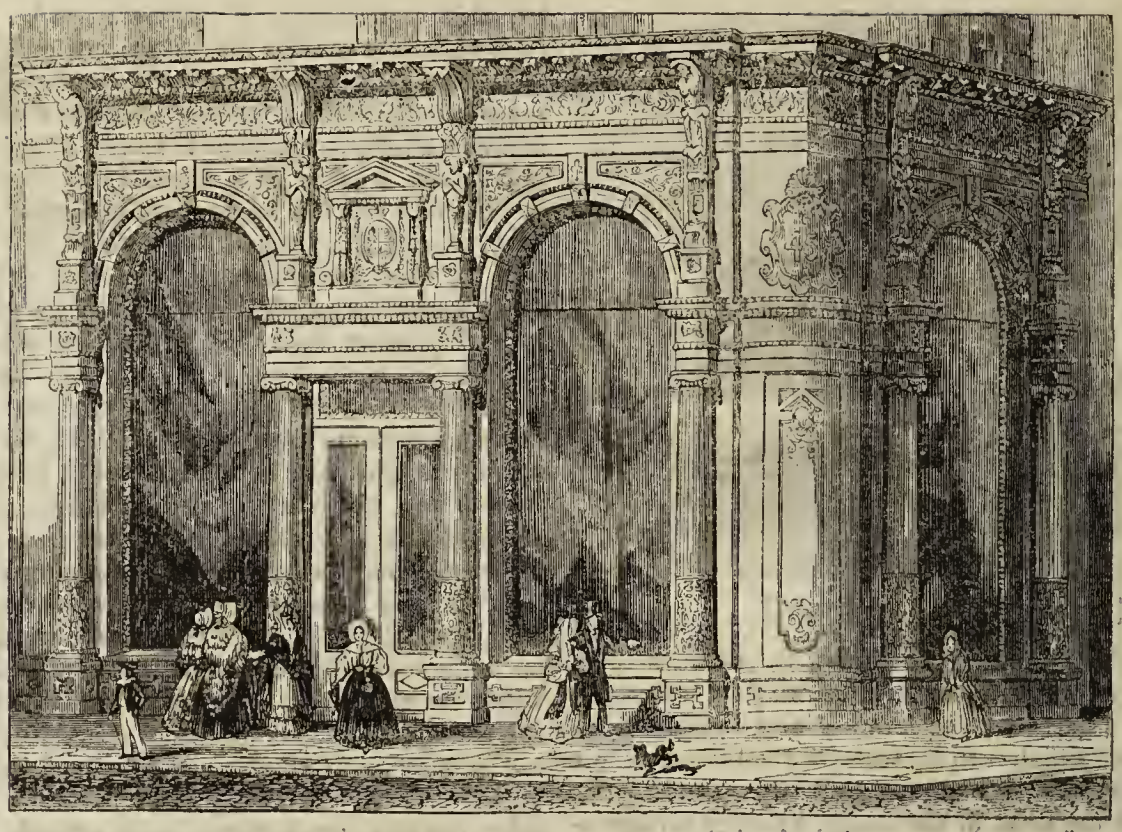
In the course of the present year two very conspicuous shop designs have been executed, the one at the corner of the Quadrant in Regent Street, opposite the County Fire-Office, the other in Oxford Street, at the corner of Berners Street, so that each has two fronts. They resemble each other not only in that circumstance, but in being both in the Renaissance or Elizabethan style, and in being considerably loftier than the other shop fronts. As an architectural composition, that at the Quadrant, of which we give a cut, possesses considerable merit, presenting the appearance of sufficient solidity and strength, and not looking as if likely to be crushed by the upper part of the house: for though spacious, the windows are of lofty upright proportions, and arched, besides which, there is some substance in the piers to which the columns supporting those arches are attached; and where the angle of the building is curved off, that space presents a broad solid pier, not, however, one that produces a blank in the composition, it being sufficiently enriched with panelling. The architectural character thus produced is excellent, nor is anything lost by the reduction thus made in the surface of window for the display of goods, as the whole is so unusually striking in itself that the shop cannot fail to attract observation. The style itself is most happily treated, and we may say purified, for while its richness and fancy are preserved, its uncouthness and faults are avoided.

The shop in Oxford Street is not so good, for though there is profusion, and its execution is good, there is neither solidity nor consistency. This is particularly the case as regards the ornamental supports substituted for columns, and which consist of a number of parts piled one upon another, which numerous subdivisions produce not only a confused effect, but the reverse of the appearance of stability, the second pedestals projecting out farther than those below; and these numerous interruptions of the vertical line are the more offensive because their horizontal mouldings are not continued elsewhere. Another great defect is, that the windows are merely wide square-headed openings filled in with plate-glass, without mullions or transoms of any kind, consequently quite destitute of what gives character to such features in the style here professed to be followed.

We have given at the head of the present notice a cut of the terminus of the London and Blackwall Railway, at the Brunswick Wharf, Blackwall. It consist of a rusticated basement, and an upper floor with five windows, and is crowned by a bold block cornice of Roman Doric character. With the wings on each side of it, the entire frontage to the river is about four hundred feet.

The Railway Station at Derby, though not at all remarkable for any architectural character, is the most spacious structure of the kind yet erected, the entire length being upwards of one thousand feet. The chief building, which is two hundred and thirty feet long and three stories in height, contains a handsome hall, offices, waiting and refreshment rooms, and other conveniences. There is also an engine-house, which is a polygon of sixteen sides, and one hundred and thirty-four feet in diameter, with a conical roof and lantern.

Union Workhouses are of all others the most ungrateful subjects, because while the rigid economy they demand



[Shop Front, Quadrant, Regent Street.]

excludes not decoration only but design itself, their very size in a manner exaggerates their deficieneies. Nevertheless the architect of the Hendon workhouse, on the entrance to Edgeware, has contrived to give it some degree of architectural interest, by keeping the larger but plainer structure in the rear, but in some degree detached from that which, although secondary in regard to size, has been judiciously made principal as to architectural consequence. This front is divided into three compartments surmounted by as many Elizabethan gables, the centre one being distinguished from the others both by difference of form and by being somewhat larger and loftier. The lodges too have similar gables. Although the gables and the turrets over the centre of the front are the most marked, yet the windows, &c. partake in a lesser degree of the same style. The board-room (thirty feet by sixteen feet, and ten feet high) is fitted up in the Elizabethan style, the walls being wainscoted and pannelled to the height of about six feet, the ceiling divided by carved beams into compartments with pendants, and the chimney-piece and doors being much enriched. This apartment is lighted by three windows, a larger one at the end facing the fire-place, and another at each of its sides. The pattern of their glazing is tasteful, and the divisions above the transoms contain shields and ornamental devices in painted glass. The entire cost of the building was 4333*l*.

The new Exchange, the Houses of Parliament, the Nelson Column, and the embellishments which are intended to be made on the site of Trafalgar Square, will form subjects for notice two or three years hence.

Two more Cemeteries are in progress in the neighbourhood of the metropolis. The West of London Cemetery, at Earl's Court, was consecrated by the Bishop of London, in June, 1840. Its area is about forty acres. The South London Cemetery, Nunhead, was consecrated in July. It lies between Peckham Rye and New Cross, and comprises fifty acres of dry well-drained land, in one of the most beautiful spots within the vicinity of the metropolis, commanding a view of Greenwich with the Thames and its shipping. The grounds have been tastefully laid out, and the architectural arrangements consist of handsome lodges, a residence for the superintendent, Episcopal and Dissenters' chapel, and extensive catacombs.

Early in the last session a Select Committee of the House of Commons was appointed on the motion of Mr. Slaney, "to inquire into the circumstances affecting the health of the inhabitants of large towns and populous districts, with a view to improved sanatory regulations for their benefit." We have not space to advert to the Report of this Committee, but the inquiry is itself a proof of the necessity which exists for considering the subject; and when the investigations going on under the Poor-Law Commissioners into the sanatory condition of the labouring population shall have been completed, we may hope that some practical remedies will be devised. The recent Act for the extension of *gratuitous* vaccination to persons of *every* class is an instance of the mode in which the poorer classes may be protected from the ravages of disease and mortality by legislative measures. Not a little good is also done by private individuals impressed with the duty and necessity of alleviating the evils which exist around them, and, by introducing relaxations of a harmless and innocent kind, of calling into exercise those feelings and principles which contribute to promote a cheerful state of mind.

Through the beneficent liberality of Mr. Joseph Strutt, Derby has been enabled to set an example to other towns in the kingdom; that gentleman having bestowed pleasure-grounds on the corporation, upon the condition that they shall be open to all classes of the public without payment on every Sunday, and also on one other day in every week, from sunrise to sunset. Had Mr. Strutt merely given the site, such donation would still have been a handsome one, but he has had the grounds (about eleven acres) expressly laid out and planted for the purpose under the direction of Mr. Loudon, and has also erected lodges, seats, &c., which are highly pleasing architectural objects and accessories. The principal entrance lodge, which also serves as the gardener's residence, is in the Tudor style, and the other lodge is in the same style, but smaller, there being no upper windows except in the gable ends. The Arboretum was opened with public festivities on the 16th of September.

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BRITISH AGRICULTURE.

DECEMBER.

[Emblems of December.—From Saxon Calendars. Centre Compartment—Threshing, Winnowing, and Carrying Corn, the Overseer keeping Count on a Tally; Cotton MS., Tiberius, B. 5. Sides—Woodman; Lansdowne MS., 381. Drinking from a Horn; Cotton MS., Nero, C. 4.]

Having now reached the last month of the year, and hence our observations upon agriculture and husbandry affairs being about to close, since the general farming operations of the present month are neither of a very interesting nor marked character, we propose, in addition to noticing what still remains to be done upon the farm, to cast a retrospective eye over our past labours, for the sake of introducing whatever we may by chance have omitted as we have travelled over the calendar.

Some of our readers may probably have remarked that, although we profess to treat of *British* agriculture, we have seldom or never directly referred to Scotland or the agriculture of that country. It may be quite true that we have not stated that such or such of our observations were intended to apply to North Britain, or to any particular section thereof, for our limits forbade us attempting a minute detail of the past and present condition of farming in every part and local division of our island; and as the leading features of Scottish agriculture scarcely at all differ from what prevails in one quarter or other of the sister kingdom, we feel assured that such of our Scottish readers as are tolerably familiar with both Scotch and English husbandry and farming affairs generally will have found that the application of many of our observations and statements came home to themselves and their own modes of farming. But there is one thing, however, connected with Scotland that we will more particularly refer to than we have done heretofore, because it is a very striking feature in the peculiar line of farming to which it belongs, though not carried on to the full extent that it used formerly to be, and which is applicable to a very considerable extent of that country, including both the Northern and Western Highlands, with the islands thereunto belonging—we mean the breeding of very large numbers of small hardy cattle, most of which are known in England by the name of Kyloes. In no part of England are cattle similarly raised upon the wastes and mountains, or at least in numbers approaching what are annually driven from the various districts of the Highlands; but in some parts of Wales the mountain wastes are stocked with a small and hardy race of cattle very much resembling the small Scotch ones. Of the breed of Welsh cattle, Mr. Youatt, in his work on 'Cattle,' in the 'Library of Useful Knowledge,' thus speaks:—"To the principality we naturally look for some trace of the native breed of cattle, for the Welsh were never entirely subdued by any of the early invaders. The Romans possessed merely a portion of that country; the Saxons scarcely penetrated at all into Wales, or not beyond the county of Monmouth; the Welsh long resisted the su-

perior power of the English under the Norman kings; and it was not until late in the thirteenth century that the principality was annexed to the crown of England. We therefore expect to find more decided specimens of the native productions of our island; nor are we altogether disappointed. Howell Dha, or Howell the Good, describes some of the Welsh cattle in the tenth century as being 'white with red ears,' resembling the wild cattle of Chillingham Castle. An early record speaks of a hundred white cows with red ears being demanded as a compensation for certain offences against the princes both of North and South Wales. If the cattle were *of a dark or black colour, one hundred and fifty were to be presented.* When the Cambrian princes did homage to the king of England, the same number of cattle, and of the same description, were rendered in acknowledgment of sovereignty. Speed tells us that Maud de Breos, in order to appease King John, whom her husband had offended, sent to his queen a present from Brecknockshire of four hundred cows and a bull, all white and with red ears. Whether this was the usual colour of the ancient breed of Welsh and British cattle, or a rare variety esteemed on account of its beauty, and chiefly preserved in the parks of the nobles, we are unable to determine. The latter is the most probable supposition; and the same records that describe the 'white cattle with red ears,' speak also of the 'dark or black-coloured breed,' which now exists, and which is general throughout the principality."

It is more than probable that the cattle belonging to the most rugged and mountainous districts of Wales remain at the present day pretty much what they were in the time of that country's independence; and although in some few parts of North Wales, and in more places in the southern division of the principality, improvements have been made from time to time by crossing the native breed with larger and better stock from several of the English counties, in several of the Welsh counties, among which may be mentioned Carmarthenshire, Cardiganshire, Carnarvonshire, Merionethshire, and Denbighshire (probably Anglesey ought to be included), the native breed of small, runty, black cattle still prevails. Small as they are, however, they appear to be larger than the breed was in early times; for the same Howell that was mentioned in the quotation we have previously introduced, in his account of them when yoked in the plough, states that the yoke for a pair of these oxen was only equal to three feet English in length, a yoke for four oxen abreast was six feet, and for eight oxen it was but twelve feet long; this on the average is an allowance of a foot and a half to each ox, and surely half a yard is a small space for any animal of the ox kind to stand in; and it must be still more so for him when he has to move along and exert himself at the plough.

We previously referred to the breed of cattle both in the Northern and Western Highlands; and they, like the original breed that we have described as still existing in Wales, are undoubtedly derived from the old and original stock of native cattle. The cattle of the north and west parts of Scotland are not of precisely the same sort, for those from the Western Islands and Argyleshire are both larger and better shaped than the cattle of Sutherland and Caithness; and the Shetland and Orkney Islands produce still smaller. When we said that the breeding of black cattle was not now so extensively carried on as it was formerly, we did not stop to explain the cause, but the reason is this—the introduction of sheep husbandry in several of the counties where formerly but very few sheep were kept; and in order to show how rapidly and extensively some of those changes have taken place, we will take a few extracts from some of the best informed writers upon the statistics of Scottish agriculture.

Respecting the primitive character of the cattle of the Hebrides, or Western Islands of Scotland, that enlightened agriculturist Adam Ferguson, Esq. gives his opinion thus, in the 'Quarterly Journal of Agriculture:'—"I cannot but regard the West Highlanders, or rather *Islanders*, as more genuine than any other breed we possess in Scotland, excepting, it may be, the small remnant of aborigines in the park of his grace the Duke of Hamilton. The moist climate, mild winter, and consequently grassy tendency of our Western Islands point them out as having been, in all likelihood, early stocked with the Boves Tauri, of fine form and healthy constitution; and the little intercourse for commercial purposes with the mainland during many ages gives a permanence to their individuality not so easily secured elsewhere."

It is stated by several writers of the day that the first Englishman who visited the Hebrides for the purpose of purchasing cattle was Mr. Moorhouse, from Craven in Yorkshire, now nearly eighty years ago. Of one individual he purchased a thousand head, at two guineas each, and of another laird six hundred head, at 2*l.* 5*s.* 6*d.* Mr. Macdonald, the author of the 'Agriculture of the Highlands,' estimated the rental of the whole of these islands at 106,720*l.*; but it would seem to be too low a calculation for the present day, since it is supposed that the Hebridean islands contain about 150,000 of these cattle, of which one-fifth are annually exported to the mainland; and estimating the average value at 5*l.* per head, the amount would be 150,000*l.*, or considerably more than the whole rental as above calculated.

"Forty years ago," says the author of 'Cattle,' already referred to, "the treatment of cattle was, with very few exceptions, absurd and ruinous, to a strange degree, through the whole of the Hebrides. With the exception of the milch-cows, but not even of the calves, they were all wintered in the fields; if they were scantily fed with hay, it was coarse and withered and half rotten; or if they got a little straw, they were thought to be well taken care of. The majority got little more than sea-weed, heather, and rushes. One-fifth of the cattle, on an average, used to perish every winter from starvation. When the cold had been unusually severe, and the snow had lain long on the ground, one-half of the stock has been lost, and the remainder have afterwards been thinned by the diseases which poverty had engendered."

At present, however, the system of farming is considerably better, and the introduction of root crops has done much towards improving the winter keep of the cattle; and notwithstanding both the soil and climate are admirably adapted for this purpose (of course we refer to the reclaimed and more fertile portions of it), yet in an unenclosed country, like most of the Western Islands, where the lands are principally in the hands of large proprietors, or else held by small and needy tenants, it can hardly be expected that tillage will be much attended to, when the grand object is to be able to graze as many head of cattle as possible, which for the most part are to be disposed of in a lean state to be fattened elsewhere.

It is not perhaps generally known to the English reader that in some of the counties in the Highlands of Scotland the ancient custom of what is provincially termed *shealing*, or rather "going to shealings," still prevails; the term shealing signifying a small hut built upon the wastes or commons, in which persons employed in herding flocks of cattle or sheep reside for a shorter or longer period during the summer season. When the cows are such as yield milk, a woman belonging to each party of cows, that may be driven to distant pasturage together in a numerous drove, inhabits one of these shealings, and her business is to make a little butter and cheese during the summer, the quantity of course depending upon the number of cows under her charge, being provided with as moderate a quantity of dairying utensils as she can possibly make a shift to manage her work with. This is but a wretched system of dairying; but it was formerly

much resorted to, and before the custom of *ewe-milking* had got into general bad repute, there was commonly a fold at no great distance from one of these huts or shealings, where the ewes were milked at night and morning, and the milk taken to the hut and converted into cheese. Dr. Robertson, in his 'Survey of Inverness,' describes the shealings after the following manner:—"After the crops had been sown and the peats cut, the inhabitants removed annually, in the month of June, to their distant pastures, with all their cattle and families; and there, in some snug spot, the best sheltered in all the range allotted to the cattle, they resided for a certain number of weeks, until the pasture became scarce. A trusty person was sent before them to drive away any wandering cattle that might have trespassed within the bounds that were to be preserved. The men returned occasionally to the farm or homestead, to collect the fuel, or hoe the potatoes, or weed the crop; and, when the season for weeding the flax arrived, the women went home for that purpose. When the bounds are extensive, they have frequently more than one of these, which are called *ree* or *aree*, in the language of the country, and *shealings* in English. In such cases, the guardian of the grass was sent forward to another shealing whenever the family arrived at that destined for their temporary residence. He was called the *poindler*, probably from his having public authority to poind (whence pound) and confine the stray cattle, and demand the fine established by law for the trespass. When these pastures were unusually rich, as at the head of a lake or by the sides of brooks in the valleys, the inhabitants of two or more farms associated together, and ate the grass of their *shealings* in common. This was the season of contentment, and often of festivity. The women employed themselves in spinning wool to clothe their families, and in making butter and cheese for part of their winter provisions; and the youths occupied themselves in fishing or athletic exercises; and at the evening the primitive custom of dancing on the green and singing Gaelic songs was not forgotten. The shealings lasted from one to two months, or perhaps more; and when the pasture was all consumed, they returned to their homesteads."

Though small as the breed of cattle still continues in most parts of what may be termed the Western Highlands, the *kyloe*, for that is the term under which these cattle are known both in their native country and when driven to the south, is a better shaped, and upon the whole a superior animal to the primitive and uncrossed breed of the Northern Highlands. Mr. W. Youatt, in describing this breed, says, "They exhibit evident traces of the same origin as the West Highlanders. They have been diminished in size by the coldness of the climate and the scarcity of food; but they have not been so seriously injured by the folly of man—they have not been domesticated to be starved outright. They are small, gaunt, ill-shaped—so far indeed as their shape can be ascertained through the long thick hair with which they are covered, and which forms an impenetrable defence against the snow and the sleet. They are rarely more than four feet high at the withers, and sometimes scarcely more than thirty-five or forty pounds a quarter." In the Orkney Islands the oxen, though small, are sometimes used in the plough; and the cows are said to yield more milk than the Shetlanders, and the cattle generally quite as easily fattened. Mr. Morison, in his 'Statistical Account of the Parish of Dalting,' gives a curious account of the manner of ploughing with these diminutive oxen:—"There are not," he says, "more than six ploughs in the parish. The plough is made of a small crooked piece of wood, at the end of which is fixed a slender pliable piece of oak, that is fastened to the yoke laid across the necks of the oxen. The man who holds the plough walks by its side, and directs it with a stilt or handle fixed to the top of it. The driver, if so he may be called, goes before the oxen, and pulls them on by a rope tied round their horns, and some people with spades follow the plough, to level the furrow and break the clods." To an English agriculturist it must almost seem incredible that such a wretched attempt at arable farming should still be allowed to exist in the nineteenth century, either in the island of Great Britain or within its adjacent isles. But such is the fact; and were we to consider the nature and difficulties that these remote islanders have to contend with, we could scarcely fail to bestow upon them our meed of approbation for their finding the means of cultivating their rocky and scanty soils at all. The inhabitants are deficient in neither the desire nor the understanding how to cultivate their land in a better way, but the most of them are destitute of the means, and are consequently obliged to submit to a dire necessity. As their crops of grain are confined almost exclusively to hardy kinds of oats, they are enabled, without the aid of more powerful teams, or a superior sort of implements, to effect their object, although it may be in a rude and inefficient manner.

On the northern mainland of Scotland, in the wild and bleak and comparatively barren counties of Caithness and Sutherland, small as most of the cattle are, they are commonly worked in the cart and the plough; in the former two being yoked abreast, and in the latter often four after the same fashion; and sometimes a small farmer will yoke a couple of ponies in front of a pair of oxen. Respecting the Caithness manner of ploughing with oxen, the Rev. Mr. Jolly, in his 'Statistical Account of Dunnot,' makes the following remarks:—"The tenants' ploughs are generally drawn by four oxen (or horses) yoked abreast. That practice appears ridiculous to strangers, but a better acquaintance with the people's circumstances would lead to a more favourable opinion. The cattle are very small and ill-fed, and hence their strength is not sufficient for drawing a plough, if they were yoked in any manner where part might have an opportunity of throwing the whole burden occasionally upon the rest. The practice, however, is attended with the inconvenience, that one of the cattle must walk in the ploughed ground: of this some are beginning to be sensible, and are substituting three cattle abreast, endeavouring to get them of a better quality. The ploughman used to walk backward, or with his face to the plough, because he could thus better observe whether the strength of the team was fairly and equally exerted."

No greater change has taken place within the last forty or fifty years, in any department of agriculture, than that which has taken place in several of the waste and mountainous districts of Scotland, in substituting sheep in the place of the ordinary small breed of cattle; and in most cases the change, which for many years was exceedingly unpopular and strenuously opposed by the great bulk of the native inhabitants, has been attended with the most beneficial results. The annexed extract, taken from the statistical accounts connected with the county of Sutherland, will show the rapid change that was effected in ten years, that is, between the years 1798 and 1808; showing the great decrease of horses, cattle, and goats, and the wonderful increase of sheep:—

	Horses.	Cattle.	Goats.	Sheep.
1798 .	7736	24,287	6227	37,130
1808 .	4291	17,333	1128	94,570
Decrease	3445	Dec. 6,954	Dec. 5099	Inc. 57,440

But it is not only that sheep are better adapted for pasturing on steep declivities and in situations that are difficult to approach, but where the few natural sorts of grasses and the herbage generally found upon those wastes and barrens are of a coarse and almost worthless character, when these are pastured by flocks of sheep, the herbage commonly becomes of a finer and better quality. In corroboration of our observations, we will quote a short passage from Dr. Robertson's 'Survey of Perthshire:'—"We ought by no means to forget the

improvement occasioned by sheep. They enrich the quality and enlarge the quantity of grass within their walk more than any other species of animal. They never deteriorate the soil; they render it more and more productive; and whenever their numbers are increased upon a certain extent of land, they help to support that increase of numbers by producing an increase of food. The ground is not only made green, and the heath extirpated by the enriching quality of their manure, but the finest grass springs up spontaneously where it had formerly been scanty and coarse; and when this powerful top-dressing of our whole hills with sheep-dung and urine has been completed, there is little doubt that the Grampians will be as verdant as the Ochils, while the Ochils had once as forbidding an aspect as the Grampians." Though much of what the Doctor here advances is true to the letter, he appears to us to go a little too far in supposing that flocks of sheep will have the effect of so completely changing the productions of those barren soils, that the gloomy heath-clad mountains and moorlands shall assume a verdant and lively appearance. We are ourselves well aware that fine grasses will sometimes spring up in the narrow tracks that mountain flocks make through extensive beds of heath in roaming from one part of the moors to another; and although they do feed occasionally upon the tops and young sprouts of the heath-plants, particularly when the snow lies deep upon the scanty herbage which they generally seem to prefer, unless they could be made to attack the more fibrous and woody parts of the heath, there is not much probability of its being generally destroyed.

Our space will not allow us to proceed further with this interesting subject, connected with those distant parts of Scotland which, for the most part, are scarcely known, except by name, to the majority of our English readers. In an early supplemental number of the 'Penny Magazine' of this year, we spoke of the great change that agriculture has effected of late years in some of the remote and secluded valleys and districts of England, and also referred to the change of habits and customs that has gradually been going on among the rural population of most of our out-of-the-way localities; and in order to show that similar if not greater changes have taken place in the northern section of our island, we will introduce two or three short quotations from authorised statistical accounts connected with particular parishes or districts of that part of the country.

In his statistical account of Walls in the Orkneys, the Rev. Mr. Bremmer speaks thus of the *shealings*:—"Their household furniture must be described negatively—no bed, no table, no chair. These the Highlander does not reckon among the necessaries of life, as he can make the earth serve him for all three. In his shealing, composed of earth and a few sticks, you find no other furniture than a few dishes for his milk and a bowl for his meal; so true in fact, as well as in philosophy, is the maxim, 'Nature is content with a little.'"

In the statistical account of Mains in Angus, by the Rev. C. Peebles, he asserts that oxen were not used in husbandry in that part of the country in the year 1790; and he proceeds to draw a very curious comparison between farmers and their mode of management in the year 1760 and at the date above alluded to. The annexed are a few of the points upon which he touches:—

1760.

Land ploughed with oxen. Only a few horses kept to draw the harrow in seed-time and bring in the common harvest; 7*l.* thought a great price for a horse.

Land rented at 6*s.* per acre, and only two small farms enclosed.

Men's stockings were what were called plaiding-hose, made of woollen cloth. The women wore coarse plaids. Not a cloak or a bonnet was worn by any woman in the whole parish

No English cloth worn but by the minister and a Quaker.

Only two hats in the parish. The men wore cloth bonnets.

There was only one eight-day clock in the parish, six watches, and one tea-kettle.

The people never visited each other but at Christmas. The entertainment was broth and beef, and the visitors sent to some alehouse for five or six pints of ale, and were merry over it without any ceremony.

1790.

Oxen not employed in agriculture. Farmers have their saddle-horses, worth from 24*l.* to 30*l.*, and work-horses from 20*l.* to 25*l.* each.

Land at 30*s.*, and all enclosed with dykes and thorn-hedges.

Cotton and thread stockings are worn by both sexes, masters and servants. Some have silk ones. The women who wear plaids have them fine and faced with silk. Silk plaids, cloaks, and bonnets are very numerous.

There are few that do not wear English cloth, and several the best superfine.

Few bonnets are worn, and the bonnet-makers' trade is given up.

Thirty clocks, one hundred watches, and about sixty tea-kettles.

People visit each other often. Six or seven dishes are on the table differently dressed. After dinner a large bowl of rum-punch or whiskey-toddy is drunk; then tea; then another bowl; then supper; and after that the grace-drink.

Many more of these great and striking comparisons might be introduced from the same author; and when we consider the remarkable changes that took place in the state of society generally during the succeeding thirty years, that is, from 1790 to 1820, the changes at the expiration of the whole period of sixty years must many of them have been very extraordinary. In the year 1793, the Rev. Mr. Lapslie, in his 'Statistical Account of Campsie, in Stirlingshire,' gives the following account of the cattle in that parish:—"There are," he says, "749 milk cows, within the last thirty years, have increased considerably in bulk, hence they have a tendency to be in flesh more than to give milk; they, however, give on the average from seven to eleven Scots pints daily. Below seven they are not thought worth keeping for the dairy; above eleven they are considered remarkable. From eight Scots pints (nearly sixteen English quarts), nearly one pound of butter is produced (22 oz. = 1 lb.), and the cheese is equal to that of Dunlop. Besides these, there are cow and queys, 503; fat cows and young beasts for the Falkirk market and the butcher, 917; and winterers, which are mostly grazed next summer for the butcher, 345. The winterers graze in the open fields during the whole winter season, and are fed once or twice a day with coarse hay gathered in autumn among the cows' feet in their pastures. The graziers commonly begin to fodder, as they term it, about Christmas (it is considered a severe winter when they are forced to begin before Christmas), and continue till the beginning of April, when the cattle refuse it. There are few cattle grazed but Highlanders, and those from Argyleshire are preferred. North-country cattle are rejected, being considered by the graziers as sour and difficult to feed." The same writer also shows the progress of the consumption of animal food through a long course of years. "In 1714," he says, "only three cows were killed for the winter beef in the whole parish, the gentry excepted. In 1744 the better farmers joined and got a cow for a winter mart, the price then being only 35*s.* or 40*s.* for a fat cow. In 1759 very decent farmers thought it necessary to have some part of a fat cow, or a few sheep, salted up for winter store; and in 1794 three hundred fat cows were killed annually, about Martinmas time, for winter provisions, besides the mutton, beef, and lamb killed through the season; and few of the tradesmen sat down to dinner without fresh meat on the table, and malt liquor to drink."

We had proposed closing our remarks here as connected with the progress of agriculture and the state of the rural population in Scotland; but since the introduction of the turnip husbandry worked so surprising an effect upon the farming interest in many parts of England, a short quotation will show that the enterprise of the Scotch farmer was not behindhand in adopting a similar system; and now for full half a century, in almost every part of the sister kingdom where the soil is at all calculated for the growth of turnip crops, the turnip culture has been found of infinite advantage to the agricultural community at large. The following extract is from 'Rural Recollections,' by Mr. G. Robertson, published somewhat over thirty years ago:—"Turnips," says he, "were first seen in this county (Kincardineshire) about the year 1754, being introduced by Robert Scott, Esq., Dunniauld, on the farm of Miltown, in the parish of St. Cyrus, which he then held in lease; but he had few to follow his example for many years. In 1764, William Lyall, a farmer in Wattieston, in the parish of Fordoun, ventured to sow half an acre in turnips, which at the time was the greatest extent in any farmer's hands, and they were disposed of chiefly in small parcels to his neighbours as kitchen vegetables, at a penny the stone. It was not till about the year 1775 that they began to be generally cultivated. They are now universal over the whole county, insomuch that about one-seventh part of the whole land in tillage is in turnips. They are cultivated uniformly in drills, and this crop now forms the very basis of good cultivation in the Mearns, whether with respect to the succeeding crops, or to the feeding of cattle, to which it is applied, but more for the rearing than for the fully fattening of them, as the thin population of the county does not require a tenth part of the fat cattle they could produce.

There are two breeds of animals that would appear to come under the denomination of farm-stock, in one or other part of the country, that we have not yet referred to—we mean, the goat and the ass, both of which are found among the most esteemed and valuable productions of some foreign countries, and which would appear to have been held in higher repute formerly in this country than they are at present. Goats formerly were very numerous in the most rugged and mountainous districts of Scotland, and the wild and sterile declivities of Wales have been noted retreats for them for ages past. But in both countries the sheep has been found a powerful rival—so much so indeed, that where goats were kept in great numbers much less than a century ago, now there is hardly one to be seen. Though goats' hair is a useful article to a certain extent, our extensive woollen manufactures have so much enhanced the value of even the coarse fleece that grows upon the back of our mountain breed of sheep, that the former can by no means compete with it. It may be true that the goat yields somewhat more milk than its rival, and were the milk of the goat or the ewe the chief object with any class of farmers, it is likely that a flock of goats would be preferred; but besides the wool of the sheep, the carcass is far more valuable; for although some persons may consider the flesh of the kid equal to either lamb or mutton, the carcass of the sheep increases in value until it attains the age of three or four years, whereas the flesh of the goat becomes rank and but little esteemed.

The ass, if it were not for the powerful rival that he finds in the horse, is capable of performing so many duties with untiring patience, that we should scarcely fail to duly appreciate his usefulness and general merits. In this country the ass has long been the drudge of the low and the vulgar, and among the middling and upper orders of society but few of them receive those attentions we find bestowed upon the horse. In a few parts of the country, particularly in some of the mining districts, where it is difficult, on account of the steepness and ruggedness of the ground, to construct roads for wheel-carriages, we find the ass employed in carrying the produce of the mines either to the furnace or the smelting-mill, or to some place of deposit from whence it can afterwards be transported in carts or waggons. Here, however, they are commonly owned by poor persons, who neither possess the means nor the inclination to procure them a good and plentiful supply of food, so that the breed is rarely attempted to be improved; indeed a precarious existence is nearly the extent that their owners ever aim at, and the ass is nominally considered to be of a certain established small value, and this may be one reason for not attempting to improve the breed. Occasionally a farmer will keep two or three she-asses in order to breed mules; but as mules, which are so generally used and so much esteemed both for riding and driving in some foreign countries, are so little sought after in England, if the custom of raising them were carried to much extent, the supply would presently exceed the demand.

It frequently happens that there is a smaller amount of husbandry performed in the present month than in any other month of the year, not even excepting January, when, according to the old adage of "freezing the pot by the fire," the degree of cold is often to an extreme. This, however, very much depends upon the state of the weather during the preceding months; if the season has, during the autumn, been favourable for out-door operations, then less remains to be performed so near the close of the year; but, on the contrary, if the autumn has been very unfavourable, then December is a season when fewer duties are required at the hands of the husbandman that at any other period. In Mortimer's 'Husbandry,' we find this epitome of the farming business of the present month:—

"The earth is now commonly locked up under its frozen coat, so that the husbandman has leisure to sit and spend what store he has beforehand provided.

"Now is the time to house old cattle, to fell all sorts of timber, and other trees for building or utensils; to cut coppices, &c.

"Let horses blood; fatten swine, and kill them. Destroy ant-hills.

"Plough up your land that you design for beans, provided it be not frozen too hard; drain corn-fields where the water stagnates; and overflow or water your meadows.

"Put your sheep and swine to the peas-rick, and fatten them for market. Cut hedges and lop trees."

What is probably intended by the term "old cattle" may principally refer to milch-cows, or to oxen employed in husbandry; but *young* cattle, or more particularly calves, require to be kept warm and dry as much as old ones. Tusser appears to have been of the same opinion as Mortimer, for he says:—

> "The housing of cattle, while winter doth hold,
> Is good for all such as are feeble and old:
> It saveth much compas and many a sleep,
> And spareth the pasture for walk of thy sheep."*

And, regarding the care and attendance of cattle during the same season, our author's advice is as shrewd and pertinent as usual:—

> "Get Trusty to tend them, not lubberly 'squire,
> That all the day long hath his nose at the fire;
> Nor trust unto children poor cattle to feed,
> But such as be able to help at a need."*

It is true that cattle may be kept too warm, as well as their being too much exposed to the cold; but a dry and moderately warm place to house cattle in during the winter season, well and sufficiently ventilated, is what ought to be provided upon every farm. Open sheds are all that is generally considered necessary for store cattle; but calves, milch-cows, working oxen, and cattle under the process of fattening, should always be provided with warm, dry, and comfortable quarters. Like most other

* 'December's Husbandry.'

departments of farming, great improvements have been introduced into the cow-stable and the cattle-shed, as well as into the form and construction of the offices and various buildings belonging to the farm-yard generally; by which means a smaller quantity of vegetable produce will feed a larger number of cattle, or other farm stock, than used formerly to be the case; and at the same time a greater quantity of manure, or at least manure of a better quality, will be produced, and this latter case, with a farmer, is always a desirable one: of the former case no one can fail fully to comprehend the advantages. It used to be the custom, almost invariably, to bind up the cattle by the heads or necks (of course we mean such as were stabled), so that they had scarcely sufficient space to move in, or to get at and consume their food; and it frequently happened that two or three cows or other cattle were tied or bound up in the same stall, with no divisions whatever between them to prevent them from turning or otherwise greatly inconveniencing each other.

By this time the winter grain has most of it begun to show upon the ground, so that if the cattle and sheep are not kept out of the corn-fields, much mischief may be done—not only by its being pastured down too close, but, especially upon heavy or clayey soils, by the poaching of the feet of the cattle, by which means so much water is retained as greatly to injure the surrounding plants, as well as to completely destroy those that have been trodden deep into the ground by the weight of the cattle.

Before hard frosts may be expected to set in, it ought to be an object with every farmer to have all his ditches and watercourses inspected, particularly the water-furrows connected with his fields of young grain; for though the lands may have been rolled, and the furrows afterwards opened, at the time of sowing two or three months ago, either the hunter or the sportsman, or some stray farm-stock, may have passed along, and so removed the soil into the furrows, so as to dam back the water, by which a space of ground of considerable extent will be flooded, and the grain to the same extent entirely destroyed.

Where large stocks of cattle are principally dependent upon turnips, it behoves the farmer to see that he has a plentiful supply of them in hand towards the close of the year; for although the ground is seldom covered with snow to a depth precluding the possibility of getting at the turnips for a long period at once, severe frosts may render turnip-pulling nearly impracticable; so that to guard against such occurrences is what every good manager ought to do. We have mentioned turnips, but of course the observation we intend should apply to other productions that may be left in the ground to this late part of the season, whether in the districts where cabbages are cultivated for the purpose of being fed to farm-stock during the winter, or to mangel-wurzel, which is not so well adapted to remain in the ground until late in the winter, for this vegetable ought to be secured before the harder frosts may be expected to come on.

Threshing, as we have elsewhere observed, is a regular winter business with most farmers, and therefore cannot be pointed out as particularly belonging to the duties of this or that month; yet during December and January there is commonly far more corn threshed out than in any other two months of the year; but on the whole this cannot be considered a month to which appertains many marked or distinct agricultural duties. The festivities of Christmas used very much to occupy the latter part of the month and the beginning of the succeeding one; and in several of the rural districts the "Christmas holidays" are still observed among all grades of the farming classes. But on the whole, Christmas is not now allowed to interfere with the labours of the husbandman or the village mechanic; and although in some measure the agriculturist may be a gainer by keeping his labourers employed during the brief season that used to be hailed as a welcome holiday, we cannot but entertain a feeling of regret that this, the almost last relic of the *good old times*, is so rapidly becoming obsolete.

Having now got to the end of our labours, and to that season of which we have been speaking, we cannot close them more appropriately than by a quotation or two from our old friend Tusser, who was not only a good farmer of the time in which he lived, but apparently a good master and a good man, as well as a rigid observer of all holidays, among which Christmas was the chief:—

"At Christmas, good husbands have corn on the ground,
In barn and in soller, worth many a pound;
With plenty of other things, cattle and sheep,
All sent them (no doubt on) good houses to keep.

At Christmas, the hardness of winter doth rage,
A griper of all things, and specially age;
Then lightly poor people, the young with the old,
Be sorest oppressed with hunger and cold.

At Christmas, by labour is little to get;
That wanting, the poorest in danger are set:
What season then better, of all the whole year,
Thy needy poor neighbour to comfort and cheer."

RETROSPECT.

[Continued from p. 296.]

July.—At the commencement of this month the weather became somewhat more settled than it had been during the latter part of June; but the slight rains which occasionally fell were on the whole very partial, yet in most places they were such as tended greatly to retard the hay-making, which had not progressed so rapidly as had been expected in those districts where the mowing commenced early; and many farmers who had hoped to finish the hay-harvest not later than the first few days of the month, were seen carrying their last loads to the stack-yard a couple of weeks afterwards. The rains which fell, however, were of great service to the country at large, since they not only had the effect of imparting a new growth to the pastures and other grass-lands, but upon the young turnips and the grain crops generally the benefit they rendered was incalculable. For the advantage of the potato crops, in most situations, there was scarcely rain enough, the consequence of which continued fully apparent up to the end of the season. By the middle of the month the rains became less frequent in many parts of the country, and hay-making was begun in the later districts, where, however, the progress was for the most part very slow. On the whole, the state of the atmosphere was cool—cooler a great deal than it had been in the preceding months; so that "sultry July" by no means supported its general character. Had it been otherwise, there would have been an early corn-harvest; and though, in the centre and south of England, on warm and early soils, there might be seen a few acres of corn cut at the close of the month, in very few situations indeed could the harvest be considered as having fairly commenced.

August.—With the commencement of this month the most splendid summer weather returned; so that the hay-harvest in the more backward situations, and the corn-harvest in the earlier ones, made all the progress that the farmers could possibly desire. This extreme of fine weather was not, however, of long continuance, for at the end of about two weeks of warm and glowing sunshine a sudden change came on, and a severe storm of wind and rain, which continued for a day or two, was felt from one end of the kingdom to the other. In some situations, and Yorkshire and Lancashire may be particularly instanced, the quantity of rain that fell was remarkably great, so much so indeed that most of the low lands were flooded, and considerable damage done, particularly where the hay had not been secured. On the whole, however, it was more a tempest of wind than of rain; and so severe a one but rarely occurs during the summer season. At the first

* 'Description of apt Time to spend.'

it was apprehended that the crops of standing corn had sustained considerable damage; but although in many places it was more or less beaten down, the rains that occasionally fell afterwards were invariably accompanied or followed by a brisk wind, so that the lodged grain did not sustain any material damage by those frequent soakings, the wind drying it as soon as the showers had passed over. Many farmers considered that their loss fully equalled the quantity used for seed, where these crops happened to be in exposed situations, and consisted of those kinds of grain that are easily whipped out; but this does not appear to have been the case generally; and, when the apprehensions were somewhat allayed, it was found that much less damage had been sustained than had at first been apprehended from so severe and general a tempest. For the grass-lands it was a timely steeping; and for the potato crops, which in many places had required more rain than had fallen during the summer, it occurred just in time to benefit them very considerably. The farmers of the hop districts were some of them severe sufferers, for many a hop-garden was levelled to the ground; and in the cider counties a great loss took place by the apples being then untimely blown off the trees; previous to which the crop had promised to be an abundant one. During the remainder of the month, the weather never again recovered the previous degree of heat; a settled serenity, however, succeeded, so truly harvest-like and desirable, that in the abundance which the farmers almost everywhere found their lands producing, the ill effects of the raging tempest seemed nearly forgotten.

September.—As August ended, so this month began, and the weather continued all that the husbandman could desire. Early in the month the harvest was everywhere rapidly drawing to a close, except in the upland and later districts; and what added to the blessing of being favoured with delightful harvest weather, was the discovery that the generality of crops proved more abundant than had been anticipated by their owners. Before the middle of the month, however, the weather became cold and rainy; but where the late crops had not been secured, the coolness of the atmosphere operated favourably in preventing the grain from sprouting. The pastures and green crops were greatly benefited by the rains which fell about this period; and although the weather was, about the middle of the month, too cold for rapid vegetation, for there were slight frosts in many places, and in the mountainous districts of the north the hills were robed in snow. Though rain continued to fall almost daily to the end of the month, the quantity that fell in most parts was but trifling until near the month's close. A few days before the month was out, the weather became warmer and rather more rainy; so that apprehensions began to be felt for the crops of corn still abroad in the north. Potatoes, except where the plants had suffered from the late frosts, continued to improve; and the turnips, except where the crop had totally failed, continued to make considerable progress. In the last week or ten days, the pastures improved amazingly; while, with the exception of the very wettest of soils, rapid progress was making towards getting the wheat-crops into the ground.

October.—Though the early frosts and the rains of the preceding month served to remind the farmer that the summer was past, and that it behoved him to secure, without much further delay, such of his crops as still remained abroad exposed to the effects of the weather, it turned out that the first three weeks of this month were far more favourable than can reasonably be expected at so advanced a period of the year. And fortunate it was for all the later agricultural districts of the kingdom that it proved so; for when Michaelmas came, the period at which most of those late districts generally calculate upon concluding their harvest operations, a considerable part of the corn crop was still abroad, some uncut, but more by far in swaths and in shock, awaiting a few fine days to put it in a condition for being carried to the barn or the stack-yard. But the seasonable weather was not limited to two or three days, for, as we have observed already, it extended over as many weeks, and scarcely ever was a late harvest more favourably terminated; and the same fine weather that so greatly benefited the later parts of the country, in enabling them to secure their crops, proved equally acceptable to the more favoured and early districts by affording them one of the finest seed-times that was almost ever known; and by the time the weather became rainy and somewhat unfavourable, a greater breadth of winter grain had been committed to the ground, which was in excellent condition for its reception, than had been the case for several past years. The improvement which we noticed as taking place in the grass-lands during last month proved highly beneficial to the country at large; and the weather continuing tolerably dry, the aftermaths and young grasses generally afforded farm-stock a more lasting and abundant supply of pasturage than they generally do; for when the ground has been saturated with rains early in the season, and the grass continually kept in a wet condition, though the quantity on the whole may be somewhat larger, it will neither last so long nor answer so good a purpose. The turnip-crops, too, to which the farmer will soon have recourse as a substitute for the failing off of the pastures, have continued to go on favourably, although generally they are represented as likely to turn out something short of an average crop; but such a result can scarcely at present be determined. The last week in the month proved more rainy, though the quantity of rain that fell on the whole was moderate; and in most parts of the country, except where the soil is particularly wet and heavy, when November came in the arable lands were still in a tolerable condition for the reception of the seed.

November.—This month, no great favourite with the agriculturist, has been, on the whole, what may be called seasonable weather, that is, a succession of changes to all descriptions of weather, except settled and fine, for there have been rains, winds, sleet, frost, and snow. Until the end of October, but little rain had fallen, comparatively speaking; but this month had scarcely set in, when deluge after deluge drenched the country, and almost entirely put a stop to out-door farming operations. The rains were accompanied with hurricanes of wind, and, if much damage did not occur inland, vast losses took place among the shipping connected with the coasting-trade of the country. The last week in the month, however, became more settled, the storms and tempests subsided, and calm days and frosty nights took place; but the degree of cold was greater than usually happens at so early a period. Vegetation, that had continued active up to this time, became thus suddenly checked; and sudden checks are invariably hurtful to the health of plants, and more particularly so to those that are young, and whose roots have not taken firm hold of the ground. Looking, therefore, at the present state of things, it seems quite likely that, even in those parts of the country where the crops were the most abundant, the farm-stock will make corresponding demands upon the turnip-field and the stack-yard before a supply of young grass will replenish the meadows and pastures in the ensuing spring.

END OF VOLUME THE NINTH.

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